This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Eng 1253.30

HARVARD UNIVERSITY

LIBRARY OF THE

BUREAU FOR RESEARCH IN
MUNICIPAL GOVERNMENT

B[illegible] FOR RESEARCH
IN MUNICIPAL GOVERNMENT

OFFICIAL RECORD

N73.60.2.1

of the

First American

National Fire Prevention Convention

Held at

Philadelphia, Pa., U. S. A.

October 13-18 (inclusive) 1913

Including all Papers and Discussions; also 1913 Report of Fire Marshal, City of Philadelphia, with 1912 and 1913 Reports of Philadelphia Fire Prevention Commission attached; also 1914 Report of Fire Waste Committee, Chamber of Commerce of the U. S. of A.; also selections from "Fire Waste"; the total constituting a Reference Book covering the Physical, Moral, Legal, Legislative and Administrative Phases of American Fire Waste.

Compiled by
POWELL EVANS
Editor

Philadelphia, Pa., U. S. A.
April, 1914

Price $1 Postpaid in U. S., Canada and England

Eng 1253.30

IMPORTANT NOTICE *RE* RECORD

The First National Fire Prevention Convention (with expense leading up to it, and which made it possible; without consideration of the time and effort involved) and this Record, have cost approximately $24,000 cash to date, of which $15,000 was provided by the conferees in traveling and hotel expenses. The remaining $9,000 in round figures was provided by the undersigned, and disbursed in cash; and any money received in excess of this amount will be placed in a proper Fire Prevention Trust fund. The various interests concerned throughout the country in abating and controlling Fire Waste should at least purchase enough of these Records to care for the cost of their preparation and publication, and the reasonable expenses involved in the Convention itself. As the first and only authoritative and completely rounded-out story of American Fire Waste this Record is entitled to the widest distribution all over the country:—generally among *property owners* and *occupants;* among *State* and *City officials* charged with duties in this connection; among *Architects, Engineers, Contractors* and *Builders,* concerned in the design and construction of buildings; and among all *Social, Civic* and *Labor* organizations concerned with the safety, comfort and decency of life.

The price first set on the volume was based on an estimate of 300 pages, which has proved only about half of its final size—and hence cost. About 8000 copies have been sold, as *partially listed on inside of back cover.* A reserve of 5000 copies, paper bound, has been printed; and will be sold *singly at $1.00 each,* postpaid in United States, Canada and England; and *75 cents each, Philadelphia* (in lots of 10 or more). If orders are received *in excess of this reserve to the number of 5000 or more by June 15th,* a second edition will be ordered from the present set-up, which will be kept intact to that date. Prompt corrections (if needed) and opinions are earnestly invited from all readers in detail by mail.

POWELL EVANS

Philadelphia, April 30, 1914.

Published by
MERCHANT & EVANS CO.
517 Arch Street
Philadelphia

Copyright, 1914
by
POWELL EVANS
Including
all rights of translation

HARVARD COLLEGE LIBRARY
RECEIVED THROUGH THE
BUREAU FOR RESEARCH IN
[illegible] GOVERNMENT

N73.60.2.1

OFFICIAL RECORD

of the

First American

National Fire Prevention Convention

Held at

PHILADELPHIA, PA., U. S. A.

October 13-18 (inclusive) 1913

Including all Papers, Discussions and Appendices

FIRE LOSSES IN THE UNITED STATES AND CANADA
1883-1913 (INCLUSIVE)

1913	$224,723,350	1898	$119,650,500
1912	225,320,900	1897	110,319,650
1911	234,337,250	1896	115,655,500
1910	234,470,650	1895	129,835,700
1909	203,649,200	1894	128,246,400
1908	238,562,250	1893	156,445,875
1907	215,671,250	1892	151,516,000
1906	459,710,000	1891	143,764,000
1905	175,193,800	1890	108,993,700
1904	252,554,050	1889	123,046,800
1903	156,195,700	1888	110,885,600
1902	149,260,850	1887	120,283,000
1901	164,347,450	1886	104,924,700
1900	163,362,250	1885	102,818,700
1899	136,773,200	1884	110,008,600

Total for 30 years $5,070,526,875
Average .... $ 169,017,562

The program completely covered the subject, and the conferees (listed on pages 527-35) represented the best thought and experience of the country in interest and geographically.

The papers and discussions, while expert and technical in the main, are readily understandable by all men. Any intelligent layman may by patiently and carefully reviewing this Record reach the heart of the problem, set forth in plain and simple language.

The views presented are the best we have in the nation in character, training and experience. They were freely and frankly voiced without restraint of any sort, and with more or less repetition to permit all shades of experience and resultant opinion.

Suggestions have been made to the Editor that much condensation be employed; but upon careful consideration this course has not been followed, and the papers and discussions have been reported almost verbatim, with a complete index to facilitate reference. Opportunity is taken here to heartily thank the busy and able men who at their own expense attended this Convention and applied themselves steadily for an entire week to its deliberations—and especially to those who prepared the able papers presented.

These individuals were without exception authorities on their respective subjects of proven merit in this field.

Any amendment, abbreviation or modification of their written or spoken views by the Editor would therefore not only approach an impertinence, but would affect the *authority* of the record, and might seriously imperil the substance and shading of the experience and thought contained therein.

The program is summarized in the table of contents. It was all necessary to cover the physical, moral, legal, legislative and administrative phases of fire waste.

The final resolution adopted in each case is recited at the conclusion of each topic.

It has been held appropriate to add to the Record as Appendices the appropriate data relating to and associated with the Convention although not actually a part of it.

Powell Evans
Editor

Philadelphia, April 30, 1914.

CONTENTS

PROGRAM

PAGE

Opening Session 9–42
Topic 1—"Location" (Exposure Hazard) 25–43
Topic 2—"Zones of Danger" 44–62
Topic 3—"Building Construction" 63–95
Topic 4—"Building Codes" 96–117
Topic 5—"Protection (Private) 118–135
Topic 6—"Protection (Public)" 136–160
Topic 7—"Equipment" 161-167
Topic 8—"Compulsory Physical Standards" 168–199
Topics 9 & 10—"Occupancy" and "Annual Occupancy License" 200–227
"Sundry Fire Hazards" 228–263
Topic 11—"Management" 264–285
Topic 12—"Legislation" 286–301
Topic 13—"Education" 302–310
Topic 14—"Insurance" 311–335
Topic 15—"Organization" 336–343

APPENDICES

Appendix 1—Correspondence with National Fire Protection Association which resulted in the large participation of its members (listed) 344–348
Appendix 2—First Annual Report of Fire Waste Committee of the Chamber of Commerce of the U. S. of A.; with Insurance data and blanks.. 349–380
Appendix 3—1913 Annual Report of Philadelphia (City) Fire Marshal; with Preliminary and First Annual Report of Fire Prevention Commission; Philadelphia Fire Marshal Law with Legal Opinion; and Detail of Active Firemen Inspections, with all Blanks 381–437
Appendix 4—"Clean-Up Week" and "Fire-Prevention Day" Notices 438, 439
Appendix 5—Pennsylvania (State) Fire Marshal Law 440, 445
Appendix 6—State Fire Prevention Association Work 446–448
Appendix 7—Notes on "German Fire Prevention Methods" 449–454
Appendix 8—"The Chemistry of Fire" 455–464
Appendix 9—Papers and Addresses leading up to the Convention. (From *Fire Waste,* by the Editor) 465–509
Appendix 10—"Preservation of Life in Factory Fires" 510–513
Some Opinions about the Convention 514–526
List of Conferees 527–535
General Index 536
Purchasers of 10 or more Records .... 3d Cover

ILLUSTRATIONS AND FORMS

Conferees in Fairmount Park 6
Philadelphia Fire Department Exhibit 8
Danger Zone Map of Philadelphia 46
Bisectional Fire Walls 64
Fire Escapes 80, 81
Fire House Area Map of Philadelphia 151
Forest Fire Lookout Station 229
Railway Car Fires 235
Insurance Inspection, Survey and Rating Blanks 362–380
"No Smoking" Sign 392
Automatic Sprinkler System (Typical) 396
Automatic Sprinklers (Standard and Curtain) in Action 398–400
Theater Fire Control Regulations and Blanks 416–420
Fire Alarm Box Sign 426
Fire Prevention Inspection Blank 431, 432
Fire Record Blank 434, 435
Joint Fire Prevention and Nuisance Blank 436, 437
"Clean-up Week" Signs 438

COMMITTEE ON RESOLUTIONS

irman, Mr. Powell Evans; Chairman, Fire Prevention Com-
of Philadelphia; and Fire Waste Committee, Chamber of Com-
f United States of America, Philadelphia.

S. W. Stratton, Director, Bureau of Standards, Department of
ce, Washington, D. C.

H. M. Wilson, Engineer, Experiment Station, Bureau of Mines,
ent of Interior, Pittsburgh, Pa.

A. Lindback, Fire Commissioner of Manitoba, President Fire
s' Association of North America.

Lewis T. Bryant, Commissioner of Labor, State of New
Trenton, N. J.

Charles H. Cole, Fire Commissioner, City of Boston.

William Guerin, Acting Chief of Fire Prevention Bureau,
New York.

Lawrence Veiller, of the Charity Organization Society, New
ty.

Henry Bruère, Director, Bureau of Municipal Research, New
ty.

Charles E. Meek, First Vice-President, National Association
t Men, New York City.

Robert D. Kohn, of American Institute of Architects, and
t of National Fire Protection Association, and of Committee of
New York City.

John R. Freeman, of Factory Mutual Fire Insurance Com-
Providence, R. I.

W. E. Mallalieu, General Manager, National Board of Fire
riters, New York City.

C. M. Goddard, Secretary New England Fire Insurance Ex-
Boston.

Oscar B. Ryon, General Counsel, National Board of Fire
riters, Chicago.

R. S. Newbern, Superintendent of Insurance, Pennsylvania
Co., Philadelphia.

C. A. Lantz, President Pennsylvania Association of Mutual
urance Companies, Lebanon, Pa.

EXHIBIT OF
PHILADELPHIA FIRE DEPARTMENT AND
HIGH PRESSURE SYSTEM
NORTH PLAZA, CITY HALL, OCTOBER 13, 1913

The National Fire Prevention Convention

Held at Philadelphia, Oct. 13th to 18th, Inclusive

(See pages 527-535 for names and relationships)

FIRST DAY, OPENING SESSION

Monday, October 13th, 1913

The meeting was called to order at 10.10 a. m. by Director Porter as follows:

I want to impress upon you my personal appreciation of your presence here, coming as you do from all over the country; and my pleasure in opening a meeting of such importance to Philadelphia, to Pennsylvania, and to the country at large. I consider it an honor to act as temporary chairman of this meeting.

We have with us men of such caliber that they may really mold the opinion which controls such a vast subject as this.

At the outset I will read to you the General Preamble and Resolutions calling this Convention.

I have before me letters to Mr. Evans from all the members of the Committee on Resolutions, approving these and the entire program.

> "WHEREAS: American fire waste of life and property has for many years been a heavy burden on the whole people; and,
>
> WHEREAS: The cost of fire insurance and protection cannot materially decrease except as the fire waste falls; and,
>
> WHEREAS: A large proportion of this fire waste is admittedly preventable and controllable by concerted State and municipal regulation; and,
>
> WHEREAS: American States and municipalities now occupy no common ground and follow no common policy and have no clearing house for concerted uniform action to prevent and control fire waste (which is a common peril and expense);
>
> THEREFORE, This National Fire Prevention Convention has been called for the following purposes:
>
> 1. To consider the *physical, moral, legal, legislative* and *administrative* means to control and reduce fire danger to life and property in America (discussion of the fire insurance underwriting problem being limited to its effective relations to the above-defined program); and

not regrets at all but simply an excuse for not performing the duty which the person concerned does not in the first place want to perform.

I say that in order to assure you, by contrast, how really sincere the Mayor's regrets are this morning. He has without reservation a very great interest in the work of the Department of Public Safety, and, especially during the last year in this work of Fire Prevention. Without exception he believes that it is one of the finest things that has been done in his administration within the past twelve months; and that it is of very great value to the community at large as well as of help to its citizens individually. And he is sincere in assuring you how anxious he is that it shall be supplemented by your experience from the outside.

ADDRESS OF WELCOME TO NATIONAL FIRE PREVENTION CONVENTION

By Hon. Rudolph Blankenburg, Mayor of Philadelphia

A cordial welcome, gentlemen of the National Fire Prevention Convention, to the City of Brotherly Love. Let me express the hope that your deliberations will result in shedding new luster and adding fresh power to your great work in the interest of the public.

You stand for two principles which must control if the country is to continue its forward march toward its highest development. You stand for elimination of waste; for prevention of loss. The crying fault in our present-day civilization is an easy disregard of some of the most important elementary principles of thrift or saving. The public attitude toward individuals, corporations and officials is one illustrated by the every day question: How much new wealth are you creating? What increase in your income has been attempted? What is the amount of new work you are inaugurating? Only too seldom are the more important questions asked: How much waste are you eliminating and how much more are people getting out of life without additional expenditure? How many leaks are you stopping in business management, in the conduct of municipal government, that prevail through carelessness or through criminal action or inaction?

These widespread neglects have for years failed to bring that retribution which would naturally follow if practiced in older lands. We commenced as a young people constantly recruiting our strength by immigration from the best nations of Europe, living in a country blest beyond any other with much area of fertile land, with immense mineral deposits and many other physical advantages. We were also favored with varying conditions of climate, which made possible every variety of agricultural industry and provided a home climate similar to that familiar to our new population from over seas, no matter from what part of the globe they came. These great natural advantages for a long time neutralized the evil effect of our mistaken economic and social practices; but with the rapid growth of population, and the occupation of hitherto undeveloped tracts of land, conditions in America have become more closely approximated to those of Europe, and the commercial struggle of to-day must be fought along lines common to the whole world. Policies, if successful to-day, must be held true to that ideal of clean living, honest working, careful scrutiny of expenditure, and curtailing of waste which have proved necessary in other lands.

One of our most conspicuous and glaring faults has been our indifference to even the simplest safeguards from attack of fire on life and property. We enjoy to-day the unsavory reputation of losing more property through fire, and sacrificing more lives, than any other nation in the world. This cannot be charged to ignorance either of the danger to which we are exposed, or of the facilities for protection enjoyed in other countries. It has simply been a case of long-continued blindness, of willful neglect of a plain duty.

This gathering of representatives from all parts of the country, each representing the effort of his own locality to curb this great national evil, is a most hopeful sign. It presages not merely reforms in the particular line of endeavor in which you are engaged, but it points to the fact that the people as a whole have awakened to the necessity of taking serious thought on a serious subject. We all realize that while nature has been most kind in giving us an environment full of aid to the development of wealth and the establishment of a powerful nation, we cannot continually draw upon this gift alone, but we must supplement the generosity of nature by commonsense action, by a trained intelligence and the deep moral sense of the responsibility that is ours as one of the leaders of the world's progress.

It is a great disappointment, gentlemen of the Convention, that indisposition prevents my greeting you face to face, but the welcome of the "Mother City of the Republic" is none the less genuine and hearty. I hand you the keys of the city and wish you, one and all, success in the great work in which you are engaged.

MR. EVANS: It goes without saying that on behalf of this city and The Fire Prevention Commission I very heartily welcome all who have come to participate with us in this great movement. The program of work that has been outlined here will perform a double function. To my mind it does not matter whether we can finish it or not, because it will yet stand as an index to any inquirer of what one has to do in defining the policy of a State or city to adequately cover this particular field of danger and responsibility.

I therefore urge upon you to put in the adequate number of days and hours to give proper consideration to these papers, all of which are necessary. And even with all that time, in my judgment, I don't think we can more than touch the high spots.

In connection with the effort necessary to accomplish positive results in a municipality of this size, I want to give one tribute to the conditions here that make work with us possible and worth while. There is little merit in effort which cannot accomplish results. It is admirable in the spirit which produces it, but futile. We are indeed fortunate who can find the means and the opportunity combined to do effective work. That opportunity exists in this city because we have an administration which is willing to accept effort and to leave it untrammeled in its course. Its aspirations are for enlarged service and efficiency, and it has encouraged its citizens to participate in that program. The extent to which we have accomplished results will be brought to your attention more in detail later, and you will form your own conclusions as to the value of that course of action. You will have ample opportunity, I am sure, and certainly ample invitation to investigate for yourselves while in this city the various departments and agencies through which this work is being conducted, so that you can get a closer point of view before you leave.

I want to say a word here in explanation of the program presented, to the effect that the details of arranging the extended list of subjects, of keeping in touch with those who have prepared papers, and of organizing the Convention, have been carried out within the past five weeks. When I left York Harbor five weeks ago there had been no invitations sent to any of the men who have prepared these papers. If they are not completely finished or in accord with your views, please bear this point in mind—that these speakers and preparers of papers have been invited to present to this conference their own views, whatever they are, and with very brief notice. I think they have done so, and I am satisfied that in every individual case you will have a frank, competent, and absolutely honest expression of opinion.

In trying to get effective results from our deliberations it seemed highly desirable to divide the subject matter into topics, so as to have some beginning and some end to each important phase. This scheme of "phasing" the work, to constitute finally complete consideration of the whole problem in logical sequence, has caused some duplication in thought; but these unavoidable duplications are valuable because they cover important things, and often from the standpoint of different minds applied to different experiences and conditions.

With respect to my own point of view, which will necessarily come before you from time to time, I do not occupy a particularly happy position in the matter. Some of my business and other associates have told me quite frankly that I was a fanatic on the subject, and that my judgment about it therefore had little merit. I have been told with equal frankness by some of my insurance friends that I was somewhat too much of a critic to be useful in the present instance.

It is impossible for any man to impartially analyze his own ideas and opinions and the motives inspiring them, but I am trying to be absolutely fair in what I do here. In my total experience of fifteen years, and a somewhat broad one of five years, in this problem, I have come to see it in many aspects. I am trying to express in this meeting the governmental point of view, and particularly that of municipal government, which my experience of the past year in this city, dealing with the many department and bureau heads in Philadelphia and other Cities and States, has allowed me to understand fairly clearly.

If there are any errors that creep into any expressions on my part that cannot be answered on the ground, I suggest that we pursue the course of action which the Conservation congresses followed with much larger aggregations of men covering a very much wider scope of work, viz: the understanding that letters may be incorporated in the Record covering matters failing to receive timely attention in the Convention. With these expressions to give you the genesis of some of the points that may later be called to your attention, I will now read the following address, because I wish to be careful in its terms:

REASONS FOR CALLING THE NATIONAL FIRE PREVENTION CONVENTION AND ITS PROGRAM

(See Appendix 9, page 465 for further reasons)

The General Preamble and Resolutions given in the invitation to this Convention were intended to fully explain why it was called. This program was planned to give a complete panoramic view of American fire waste conditions, to the end that any state and city desiring to undertake its control and abatement might have a summary of all the things to be done and the governing principles and practices as to all these items—in the judgment of the parties to this Convention—which must necessarily be largely complied with to accomplish this purpose effectively. The subject is too important and ranges over too much ground in every direction for greatly detailed treatment in the time at our disposal. Governments—State and Municipal—and their citizens, singly or in groups, must work out their local solutions. If this

Convention stimulates active and intelligent work in this direction—especially if it leads to measurably uniform and combined effort—it will have accomplished its main purpose. No specially new information is claimed; but the point of view as a whole, and the arrangement and totalizing of the problem, may prove useful. The consideration of this program by conferrees representing so widely and strongly all interests of the country concerned cannot but shed new light on the subject of American fire waste, and arouse public interest in the fight against it. This program may not be the best in form or substance. It is merely offered as an honest effort resulting from long study to serve as a basis for debating all phases of an admittedly urgent and tremendous social and economic evil.

Fire waste is as old as life. It has always been considered measurably necessary. Its cost has for many years—virtually throughout the civilized world, without limit even to national boundaries—been distributed as a burden upon all the people through the medium of fire insurance. There is a marked difference in the amount of this waste—measured per capita or on an insurance basis—between different nations, as well as between groups of nations. On the average the cost of fire waste and insurance in Western Europe is about 1/10 that in North America, due mainly to better building construction, more intelligent control of occupancy, thriftier habits of the people and better governmental regulation of the entire subject abroad.

Until quite recent years the real causes and corrections of fire waste with us have been clearly known and understood only by the relatively small circle of fire insurance underwriters and their associates. About ten years ago the plan of a State officer empowered to investigate and regulate fire waste was first adopted in Massachusetts. By 1906 about half a dozen other States had followed suit. During the past five years there has been a marked awakening throughout all circles of the country concerning the size and character of fire waste in life and property, and the fact that it is in large part needless and preventable. During this time 40 States have installed Fire Marshals (or other officers with similar powers), and many municipalities having realized that the bulk of this danger and loss was in their congested areas, have begun to exercise police power more freely and intelligently through varying agencies to control and abate it. Of late, especially, civic and commercial bodies are recognizing their stake and responsibility in the matter, and are beginning with fast growing understanding to take a determined hand in bettering fire waste conditions. Insurance which distributes the cost of fire waste is so much a part of the whole question that it must now be briefly reviewed.

The insurance world as a whole has, in physical and engineering research, rendered magnificent assistance in working out the problem of fire control. As a business proposition of conducting commercial fire insurance underwriting at a profit—insurance is procurable on properly located, constructed, protected, occupied and managed property in America at low final cost—on the one hand from the *Factory Insurance Associations* (groups of certain Stock Insurance Companies), and from certain individual Stock Insurance Companies which specialize in the insurance and reinsurance of such selected risks, at low *fixed* charges; and, on the other hand, from the *Associated Factory Mutual Fire Insurance Companies* (Mill Mutuals) on low *mutual* charges determined by the final net coöperative loss.

Much farm and village property is insured in numerous small rural Mutual Companies throughout the country. The Mill Mutuals operate through a central Inspection Bureau, aided by a Laboratory for the study and determination of physical standards—both in Boston. They, as well as the Stock Factory Insurance Associations, are specially active in spreading the doctrine of fire prevention in all its phases and hence are able to conduct continuously profitable underwriting at net final charges of from five to ten cents per $100. Such insurance is all done without commissions to agents and brokers. Insurance in the U. S. covers about $35,000,000,000 of property—about 80% of which is stock insurance averaging a rate of approximately 1% per annum.

The bulk of city property is *Stock* insured at *flat* rates. These rates are determined by the application of an automatic universal rate schedule, based on the ideal building for its respective occupancy on an ideal location, which is modified by the local rate conditions (fixed by the local Stock underwriting board having jurisdiction) and further modified by the condition of the property itself (ascertained through surveys by the same local board).

Many of these local boards have, especially in recent years, displayed commendable interest and energy in broadcasting fire preventive doctrines; and the active managers of these have welcomed the submission of plans for construction and reconstruction of buildings in advance for fire prevention and protection criticism—all of which is admirable work. Others, however, are so influenced by the agent and broker element in their membership as to be measurably indifferent to this aim.

The total personnel of all these interweaving boards is so great, however, and the views and purposes so varying, that no fixed general policy is yet in evidence on their part as a whole to exercise their best knowledge, experience and influence to prevent fire waste to the practical limits possible.

The National Board of Fire Underwriters (New York) is the central Stock body which speaks for the policy of the Stock Insurance interests. It operates the Underwriters Laboratories, Inc., (Chicago), for the detailed physical study and determination of Fire Appliances (*Standards of Devices*) in general coöperation with the Mutual Laboratory (Boston); and does much good publicity work.

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil

3. A system of underwriting which as a rule penalizes bad condition only by charging a high rate on such bad conditions (which are discovere by constant inspection) and limiting the amount of such risks written. Mos of this bulk underwriting is done through Agents and Brokers, now claime to be too highly paid and inadequately regulated, whose influence is banefu to the extent that both on the average are merely eager to do the larges business at the highest commission, and hence are not interested in propert loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who als need more regulation—as recent arson cases in New York and Chicago hav disclosed. In the main the aim of the large majority of Insurance Unde writers is to make their business profitable. This end is best attained b collecting the largest gross premiums and saving at least half of these b

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately*. It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

this State and City; and finally had the Pa. State Fire Marshal law drafted (covering the essential provisions of such laws in other States, and the peculiar requirements—Constitutional and otherwise—necessary for this State) to the best judgment of all concerned and interested in the matter.

We secured the passage of this bill; and a substantially satisfactory amendment to a like bill for the City of Philadelphia proposed by the then administration.

When the present City administration of Philadelphia assumed office in the Fall of 1911 I interested the Mayor and the Director of Public Safety in this program; and arranged for a preliminary analysis of the City government with respect to fire control—in conjunction with Mr. Charles A. Hexamer, Secretary of the Philadelphia Fire Underwriters Association, and Dr. Jesse D. Burks, Director of the Phila. Bureau of Municipal Research, which was submitted March 16, 1912. This gave a picture of the inadequate care for the matter then existing, with all the deficiencies and confusions and tentative suggestions of the cure.

The Mayor then appointed, through the Director of Public Safety, the "Fire Prevention Commission" of nine members, with headquarters in the City Hall, which entered upon its active work November 25, 1912.

As Chairman of that Commission I arranged for financing it privately and established a salaried personnel to conduct its work as a business. Our investigations led to definite conclusions on many points—particularly on legislation and administration. We reached among others the profound conviction that continued inspection of property throughout the city was as essential for effective abatement of the evil, and that ample time and forc existed in the paid Fire Department to supply continuous and adequat inspection service to this end. This policy was adopted by the Administratio and put into effect January 27th with six firemen, including a captain, wh were sent to New York for a brief study of such methods there. Thi activity, so started, gradually grew until at present there are 75 activ firemen inspecting properties on a definite system. A special detailed pap on this subject, comparing it with like activities in other American cities, in process of preparation for incorporation in the records of this Conventio

With an average of 20 active firemen over a period of seven months th following results have been achieved up to October 1st, which speak f themselves:

22,000 buildings were originally inspected and reported in accord wi an exact system.

13,500 of these buildings were reinspected to assure that the reco mendations made in the original inspections were complied with.

57,000 detail improvements were incorporated in these requirements; a it is noteworthy to state that they have all been complied with without fricti

to date. As this work in Philadelphia, planned and initiated as above described, progressed we found much valuable data and experience procurable from a few other progressive States and cities in the country. It was evident, however, that the great bulk of the country was scarcely awake to the known means whereby nation-wide actual progress in fire waste control could be effected, and only touched the high spots in their solution of the problem—and these not in common. As the cost of Insurance is admittedly a nation-wide tax, based on the average of the total fire waste of property and associated expenses and profits (not including the cost for public fire protection), it is obvious that there must be a nation-wide reduction of fire waste if the insurance cost is to be reduced; and further that loss of life and health, and from business interruption arising from this cause, can only be lowered by reducing the property loss. The United States Geological Survey (U. S. Department of the Interior), 1907, Bulletin No. 418, on "The Fire Tax and Waste of Structural Materials in the United States"; as well as the annual reports of the National Board of Fire Underwriters during the past five years; provide the best summaries of this waste;—which is now estimated at $300,000,000 per annum, or including associated costs, $450,000,000 per annum—the lower figure averaging a charge of $3.00 per capita per annum upon every man, woman and child in the country, distributed throughout everything they use in life.

Admittedly a legally enforced policy of fire prevention and protection all over the country will attack the source of fire waste; and would save, according to the soundest judgment, from one-half to two-thirds of this loss of life and property within the life of most of the people now living. This is the most important avenue of improvement in life and property loss from fire and of reduction in insurance cost. The further possible reduction in insurance cost derivable from lowering their expense of doing business by reduction of the ruling extravagant commissions paid for selling insurance contracts can only be referred to here now.

Fire, the cause of all this trouble, is always local in origin. Under our governmental system the State is the unit of local control and can in turn regulate its cities and country districts; and so we must look to a sum total—uniform as nearly as may be—of State action, imposed in turn over all of the area of each, if we are to eliminate the bulk of American fire waste. Progress in this matter in a few States and cities does not bring reasonable or adequate relief. Large and wide betterment must be achieved to produce the average proper reduction in life and property waste, and in the cost of insurance and public fire protection.

With this experience, and these views, and my relation to the present efficient and progressive municipal government of Philadelphia, I arranged this Convention—to gather at one time and place a strong representation of the three great parties to this problem, viz:

1. Representatives of National, State and Municipal *governments.*
2. Representatives of Insurance *buyers* in the aggregate (civic, labor and business associations).
3. Representatives of Insurance *sellers* in the aggregate (Insurance Associations and Companies).

The program and tentative resolutions were—as stated before—formulated to discuss in principle every element entering into the problem, particularly from the practical legislative and administrative viewpoints. Every effort has been made to pass this in review before as wide a range of coöperative criticism—both in interest and geographically—as was able to participate in the Convention. There was some doubt in the minds of the Insurance personnel as to the final purpose of this Convention, but this doubt was solved to their satisfaction as is indicated by the N. F. P. A. correspondence incorporated in the program.

The proposed papers and discussions cover the five main physical considerations as to fire danger, viz:

Location, Construction, Protection, Equipment and *Occupancy,* in prope logical order—first considered ***individually*** and second ***generically*** (from th community standpoint), in each case—this accounting for the first ten topic The remaining five topics embrace the general problems affecting the foregoin

The proposed resolutions were intended as a whole to constitute th track along which the Convention would run, by defining the controllin principles involved seriatim, and at the same time limiting progressively th ground to be covered—so as to result in an effective interweaving of the who without discord, gaping or overlapping. The modern "Housing" consider tions must be held in full view in all such work.

The necessity for strictly limiting the time and scope of both papers an discussions was clearly demonstrated by the International Congress on Fi Waste held in London, 1903, as their Chairman definitely pointed out when adjourned.

Emphasis is laid on the fact that these resolutions are tentative and subje to final amendment in each case to express the final actual views of t Convention. The terms and definitions employed were intended to have t usual force and meaning usually employed in Insurance matters. Some our conferees may not agree on these points—as for example, housing exper who would take the word "occupancy" to mean a far larger sum of conside tions than the narrower Insurance definition would include.

It is hoped, however, that all the propositions submitted may be allow to follow reasonably closely the path adopted, so that our brief time (compa with the size and importance of the subject) and our best thought will tered on a frank conference on the essence of the problem before us.

This Convention covers a large project and high aspirations for the common benefit of all of our people. It may be the beginning of a wide and concerted effort in new form to control fire waste, and it rests with us all to make this beginning as effective and instant in result as may be possible.

Has not the time come, however, for the National Government to do a great service to the country by collecting the total studies on *Fire Waste, Prevention, Protection* and *Insurance,* and formulating these suggestions and conclusions for use by the country?

While every fire is local in its origin, the sum total of all fires, or fire waste, is certainly national in effect; and the necessary method of collecting this tax through the virtually semi-public function of Insurance underwriting and the insurance policy contract constitute a truly national problem with us at this time.

I quote in conclusion on this point from the Illinois Fire Insurance Commission, viz:

> "From nearly every standpoint fire insurance seems to be interstate in its nature, perhaps more nearly so than any other business. It is based upon averages and distribution, and if we take into account large conflagrations neither average nor distribution can be intelligently applied within the limits of any single state."

As the author of the above paper, I will be glad if Director Porter will take the chair for the moment so that we may use the sufficient time at our disposal for any frank expressions of opinion about it before the exhibition of the Fire Department of Philadelphia takes place at noon.

DIRECTOR PORTER: Remember, we are one big family, and don't hesitate to express your opinions, because it is only in the frank expression of opinion that we can really arrive at the result we want to reach.

(Waits for discussion of paper. No speakers.)

It may be possible that some of you would prefer not to express your opinion at this time on so intricate a paper. These subjects will be in your hands later, and then discussion will again be in order.

At twelve o'clock to-day the Fire Department of Philadelphia will give an exhibition of the high-pressure fire system—the first in the United States. It can be viewed from the City Hall.

The Chief of the Philadelphia Fire Department will be glad to welcome any visiting chief who may be here. You may get in touch with him in Room 119.

At two o'clock this afternoon the first business session of the Convention will be held at the Bellevue-Stratford, and it is hoped that all those here will be present to participate in the proceedings.

The committee having this meeting in charge realizes that "all work and no play make Jack a dull boy;" so the business meetings will be interspersed with entertainment.

I would like each of you to know the other, and I think it would be desirable to have your name on your badge. Those who have not yet registered and secured badges would do well to arrange this now.

In your leisure moments there are many things in Philadelphia to see, particularly in this building; and all wishing to secure a bird's-eye view of a city of 350,000 homes may do so by taking the elevator to the top of the City Hall tower. The City Hall is open at any time to accommodate you in any way possible; and we want you to be perfectly at home. We enjoy the reputation of being a hospitable city, and if you find in your going around that we are not living up to the mark we want you to "call us down" and tell us about it, and we will do everything we can for you. Will Mr. Evans kindly resume the Chair?

MR. EVANS: If we meet promptly at two o'clock we may have a longer discussion of papers which are well worth while.

In a Convention of this sort where there is no absolute basis of representation it is obviously impossible to reach a conclusion that can be measured scientifically. It would be a hardship for those representing the city of New York to vote on an important question on a parity with an individual concern engaged in some form of manufacture. We are trying to get in this Convention the best combined judgment as a group.

Something over 300 acceptances have been received within recent days, and more will probably come in during the week. On Thursday afternoon we will probably have a large attendance from the different trade and business associations throughout the city, particularly because of the expected visit from Secretary of Commerce Redfield and his address.

If there are no other points at present I will declare the meeting adjourned until two o'clock to reconvene in the ballroom of the Bellevue-Stratford Hotel.

Adjourned.

Topic 1—"Location" (Exposure Hazard)

NOTE.—Every building, and its contents in life and property, must stand on some finite, geographical spot; and carry to, and receive from, its environing property measurable fire hazards—hence this fundamental *unit* consideration.

MR. EVANS, *Chairman:* In starting the afternoon session I will make a brief statement. We made the proposal of this Convention to the Mayor and he was in entire sympathy with its being called on the part of the city; but the city had no funds, or means of obtaining funds, for carrying it into effect or publishing the record. In view of being able to publish the record of these proceedings with the consent of the city, and the sympathetic coöperation of the officers of the National Fire Protection Association, we issued requests to something like a thousand manufacturers all over the country to aid this plan by taking paid advertisements in it. We had estimated between 300 and 400 pages of record, and added the cost of the advertising section, so that if this plan had been adopted the cost of the books would have been about 50 cents each, postage prepaid. We had planned to distribute 25,000 of them to libraries, city and State officials, and various associations having interest in the subject. We have now been asked by a number of technical papers for copies of these addresses, but have felt, under the circumstances, that they should not be released. There is a little feeling, I am inclined to think, on the part of some of these journals that we are not quite fair to them in the matter; and I wish to state to you all the circumstances in this connection. The proposal in respect to this entire matter was that whatever money was received would be used exclusively for the expenses of the Convention and record—the sources of income to be publicly acknowledged in detail; and any residue to be held as a trust fund for carrying on a National Fire Prevention movement.

I have no excuses whatever to offer with respect to this proposal, and you now have all the facts.

The first paper on the program, under the tentative resolution announced, is by Mr. McDowell, who has been very active in this sort of work for years.

THE "LEGAL BASIS FOR REGULATION OF HAZARD OF EXPOSURE TO FIRE"

By Mr. William Strite McDowell, Counsel and Secretary of the Commission for the Revision of the Building Laws of Pittsburgh, Pennsylvania

In the beginning it is well that we understand that, in so far as this paper seeks to be authoritative, it is based on "the law of the land," which, from the author's viewpoint, is that part of the United States

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

this State and City; and finally had the Pa. State Fire Marshal law drafted (covering the essential provisions of such laws in other States, and the peculiar requirements—Constitutional and otherwise—necessary for this State) to the best judgment of all concerned and interested in the matter.

We secured the passage of this bill; and a substantially satisfactory amendment to a like bill for the City of Philadelphia proposed by the then administration.

When the present City administration of Philadelphia assumed office in the Fall of 1911 I interested the Mayor and the Director of Public Safety in this program; and arranged for a preliminary analysis of the City government with respect to fire control—in conjunction with Mr. Charles A. Hexamer, Secretary of the Philadelphia Fire Underwriters Association, and Dr. Jesse D. Burks, Director of the Phila. Bureau of Municipal Research, which was submitted March 16, 1912. This gave a picture of the inadequate care for the matter then existing, with all the deficiencies and confusions and tentative suggestions of the cure.

The Mayor then appointed, through the Director of Public Safety, the "Fire Prevention Commission" of nine members, with headquarters in the City Hall, which entered upon its active work November 25, 1912.

As Chairman of that Commission I arranged for financing it privately and established a salaried personnel to conduct its work as a business. Our investigations led to definite conclusions on many points—particularly on legislation and administration. We reached among others the profound conviction that continued inspection of property throughout the city was an essential for effective abatement of the evil, and that ample time and force existed in the paid Fire Department to supply continuous and adequate inspection service to this end. This policy was adopted by the Administration and put into effect January 27th with six firemen, including a captain, who were sent to New York for a brief study of such methods there. Thi activity, so started, gradually grew until at present there are 75 activ firemen inspecting properties on a definite system. A special detailed pape on this subject, comparing it with like activities in other American cities, i in process of preparation for incorporation in the records of this Convention

With an average of 20 active firemen over a period of seven months th following results have been achieved up to October 1st, which speak fo themselves:

22,000 buildings were originally inspected and reported in accord wit an exact system.

13,500 of these buildings were reinspected to assure that the recommendations made in the original inspections were complied with.

57,000 detail improvements were incorporated in these requirements; an it is noteworthy to state that they have all been complied with without frictio

to date. As this work in Philadelphia, planned and initiated as above described, progressed we found much valuable data and experience procurable from a few other progressive States and cities in the country. It was evident, however, that the great bulk of the country was scarcely awake to the known means whereby nation-wide actual progress in fire waste control could be effected, and only touched the high spots in their solution of the problem—and these not in common. As the cost of Insurance is admittedly a nation-wide tax, based on the average of the total fire waste of property and associated expenses and profits (not including the cost for public fire protection), it is obvious that there must be a nation-wide reduction of fire waste if the insurance cost is to be reduced; and further that loss of life and health, and from business interruption arising from this cause, can only be lowered by reducing the property loss. The nited States Geological Survey (U. S. Department of the Interior), 1907, ulletin No. 418, on "The Fire Tax and Waste of Structural Materials in the nited States"; as well as the annual reports of the National Board of Fire nderwriters during the past five years; provide the best summaries of this waste;—which is now estimated at $300,000,000 per annum, or including sociated costs, $450,000,000 per annum—the lower figure averaging a charge f $3.00 per capita per annum upon every man, woman and child in the untry, distributed throughout everything they use in life.

Admittedly a legally enforced policy of fire prevention and protection ll over the country will attack the source of fire waste; and would save, ccording to the soundest judgment, from one-half to two-thirds of this loss n life and property within the life of most of the people now living. This s the most important avenue of improvement in life and property loss from ire and of reduction in insurance cost. The further possible reduction in surance cost derivable from lowering their expense of doing business by duction of the ruling extravagant commissions paid for selling insurance con- acts can only be referred to here now.

Fire, the cause of all this trouble, is always local in origin. Under our vernmental system the State is the unit of local control and can in turn ulate its cities and country districts; and so we must look to a sum total— niform as nearly as may be—of State action, imposed in turn over all of e area of each, if we are to eliminate the bulk of American fire waste. ogress in this matter in a few States and cities does not bring reasonable adequate relief. Large and wide betterment must be achieved to produce average proper reduction in life and property waste, and in the cost of rance and public fire protection.

With this experience, and these views, and my relation to the present ficient and progressive municipal government of Philadelphia, I arranged s Convention—to gather at one time and place a strong representation the three great parties to this problem, viz:

The committee having this meeting in charge realizes that "all work and no play make Jack a dull boy;" so the business meetings will be interspersed with entertainment.

I would like each of you to know the other, and I think it would be desirable to have your name on your badge. Those who have not yet registered and secured badges would do well to arrange this now.

In your leisure moments there are many things in Philadelphia to see, particularly in this building; and all wishing to secure a bird's-eye view of a city of 350,000 homes may do so by taking the elevator to the top of the City Hall tower. The City Hall is open at any time to accommodate you in any way possible; and we want you to be perfectly at home. We enjoy the reputation of being a hospitable city, and if you find in your going around that we are not living up to the mark we want you to "call us down" and tell us about it, and we will do everything we can for you. Will Mr. Evans kindly resume the Chair?

MR. EVANS: If we meet promptly at two o'clock we may have a longer discussion of papers which are well worth while.

In a Convention of this sort where there is no absolute basis of representation it is obviously impossible to reach a conclusion that can be measured scientifically. It would be a hardship for those representing the city of New York to vote on an important question on a parity with an individual concern engaged in some form of manufacture. We are trying to get in this Convention the best combined judgment as a group.

Something over 300 acceptances have been received within recent days, and more will probably come in during the week. On Thursday afternoon we will probably have a large attendance from the different trade and business associations throughout the city, particularly because of the expected visit from Secretary of Commerce Redfield and his address.

If there are no other points at present I will declare the meeting adjourned until two o'clock to reconvene in the ballroom of the Bellevue-Stratford Hotel.

Adjourned.

FIRST DAY, AFTERNOON SESSION

Topic 1—"Location" (Exposure Hazard)

NOTE.—Every building, and its contents in life and property, must stand on some finite, geographical spot; and carry to, and receive from, its environing property measurable fire hazards—hence this fundamental *unit* consideration.

MR. EVANS, *Chairman:* In starting the afternoon session I will make a brief statement. We made the proposal of this Convention to the Mayor and he was in entire sympathy with its being called on the part of the city; but the city had no funds, or means of obtaining funds, for carrying it into effect or publishing the record. In view of being able to publish the record of these proceedings with the consent of the city, and the sympathetic coöperation of the officers of the National Fire Protection Association, we issued requests to something like a thousand manufacturers all over the country to aid this plan by taking paid advertisements in it. We had estimated between 300 and 400 pages of record, and added the cost of the advertising section, so that if this plan had been adopted the cost of the books would have been about 50 cents each, postage prepaid. We had planned to distribute 25,000 of them to libraries, city and State officials, and various associations having interest in the subject. We have now been asked by a number of technical papers for copies of these addresses, but have felt, under the circumstances, that they should not be released. There is a little feeling, I am inclined to think, on the part of some of these journals that we are not quite fair to them in the matter; and I wish to state to you all the circumstances in this connection. The proposal in respect to this entire matter was that whatever money was received would be used exclusively for the expenses of the Convention and record—the sources of income to be publicly acknowledged in detail; and any residue to be held as a trust fund for carrying on a National Fire Prevention movement.

I have no excuses whatever to offer with respect to this proposal, and you now have all the facts.

The first paper on the program, under the tentative resolution announced, is by Mr. McDowell, who has been very active in this sort of work for years.

THE "LEGAL BASIS FOR REGULATION OF HAZARD OF EXPOSURE TO FIRE"

By Mr. William Strite McDowell, Counsel and Secretary of the Commission for the Revision of the Building Laws of Pittsburgh, Pennsylvania

In the beginning it is well that we understand that, in so far as this paper seeks to be authoritative, it is based on "the law of the land," which, from the author's viewpoint, is that part of the United States

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately*. It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

this State and City; and finally had the Pa. State Fire Marshal law drafted (covering the essential provisions of such laws in other States, and the peculiar requirements—Constitutional and otherwise—necessary for this State) to the best judgment of all concerned and interested in the matter.

We secured the passage of this bill; and a substantially satisfactory amendment to a like bill for the City of Philadelphia proposed by the then administration.

When the present City administration of Philadelphia assumed office in the Fall of 1911 I interested the Mayor and the Director of Public Safety in this program; and arranged for a preliminary analysis of the City government with respect to fire control—in conjunction with Mr. Charles A. Hexamer, Secretary of the Philadelphia Fire Underwriters Association, and Dr. Jesse D. Burks, Director of the Phila. Bureau of Municipal Research, which was submitted March 16, 1912. This gave a picture of the inadequate care for the matter then existing, with all the deficiencies and confusions and tentative suggestions of the cure.

The Mayor then appointed, through the Director of Public Safety, the "Fire Prevention Commission" of nine members, with headquarters in the City Hall, which entered upon its active work November 25, 1912.

As Chairman of that Commission I arranged for financing it privately and established a salaried personnel to conduct its work as a business. Our investigations led to definite conclusions on many points—particularly on legislation and administration. We reached among others the profound conviction that continued inspection of property throughout the city was an essential for effective abatement of the evil, and that ample time and force existed in the paid Fire Department to supply continuous and adequate inspection service to this end. This policy was adopted by the Administration and put into effect January 27th with six firemen, including a captain, who were sent to New York for a brief study of such methods there. This activity, so started, gradually grew until at present there are 75 active firemen inspecting properties on a definite system. A special detailed paper on this subject, comparing it with like activities in other American cities, i in process of preparation for incorporation in the records of this Convention

With an average of 20 active firemen over a period of seven months th following results have been achieved up to October 1st, which speak fo themselves:

22,000 buildings were originally inspected and reported in accord with an exact system.

13,500 of these buildings were reinspected to assure that the recommendations made in the original inspections were complied with.

57,000 detail improvements were incorporated in these requirements; an it is noteworthy to state that they have all been complied with without frictio

to date. As this work in Philadelphia, planned and initiated as above described, progressed we found much valuable data and experience procurable from a few other progressive States and cities in the country. It was evident, however, that the great bulk of the country was scarcely awake to the known means whereby nation-wide actual progress in fire waste control could be effected, and only touched the high spots in their solution of the problem—and these not in common. As the cost of Insurance is admittedly a nation-wide tax, based on the average of the total fire waste of property and associated expenses and profits (not including the cost for public fire protection), it is obvious that there must be a nation-wide reduction of fire waste if the insurance cost is to be reduced; and further that loss of life and health, and from business interruption arising from this cause, can only be lowered by reducing the property loss. The United States Geological Survey (U. S. Department of the Interior), 1907, Bulletin No. 418, on "The Fire Tax and Waste of Structural Materials in the United States"; as well as the annual reports of the National Board of Fire Underwriters during the past five years; provide the best summaries of this waste;—which is now estimated at $300,000,000 per annum, or including associated costs, $450,000,000 per annum—the lower figure averaging a charge of $3.00 per capita per annum upon every man, woman and child in the country, distributed throughout everything they use in life.

Admittedly a legally enforced policy of fire prevention and protection all over the country will attack the source of fire waste; and would save, according to the soundest judgment, from one-half to two-thirds of this loss of life and property within the life of most of the people now living. This is the most important avenue of improvement in life and property loss from fire and of reduction in insurance cost. The further possible reduction in insurance cost derivable from lowering their expense of doing business by reduction of the ruling extravagant commissions paid for selling insurance contracts can only be referred to here now.

Fire, the cause of all this trouble, is always local in origin. Under our governmental system the State is the unit of local control and can in turn regulate its cities and country districts; and so we must look to a sum total—uniform as nearly as may be—of State action, imposed in turn over all of the area of each, if we are to eliminate the bulk of American fire waste. Progress in this matter in a few States and cities does not bring reasonable and adequate relief. Large and wide betterment must be achieved to produce an average proper reduction in life and property waste, and in the cost of insurance and public fire protection.

With this experience, and these views, and my relation to the present efficient and progressive municipal government of Philadelphia, I arranged this Convention—to gather at one time and place a strong representation of the three great parties to this problem, viz:

1. Representatives of National, State and Municipal *governments.*
2. Representatives of Insurance *buyers* in the aggregate (civic, labor and business associations).
3. Representatives of Insurance *sellers* in the aggregate (Insurance Associations and Companies).

The program and tentative resolutions were—as stated before—formulated to discuss in principle every element entering into the problem, particularly from the practical legislative and administrative viewpoints. Every effort has been made to pass this in review before as wide a range of coöperative criticism—both in interest and geographically—as was able to participate in the Convention. There was some doubt in the minds of the Insurance personnel as to the final purpose of this Convention, but this doubt was solved to their satisfaction as is indicated by the N. F. P. A. correspondence incorporated in the program.

The proposed papers and discussions cover the five main physical considerations as to fire danger, viz:

Location, Construction, Protection, Equipment and *Occupancy,* in proper logical order—first considered *individually* and second *generically* (from the community standpoint), in each case—this accounting for the first ten topics The remaining five topics embrace the general problems affecting the foregoing

The proposed resolutions were intended as a whole to constitute the track along which the Convention would run, by defining the controlling principles involved seriatim, and at the same time limiting progressively the ground to be covered—so as to result in an effective interweaving of the whole without discord, gaping or overlapping. The modern "Housing" considerations must be held in full view in all such work.

The necessity for strictly limiting the time and scope of both papers and discussions was clearly demonstrated by the International Congress on Fir Waste held in London, 1903, as their Chairman definitely pointed out when i adjourned.

Emphasis is laid on the fact that these resolutions are tentative and subjec to final amendment in each case to express the final actual views of th Convention. The terms and definitions employed were intended to have th usual force and meaning usually employed in Insurance matters. Some o our conferees may not agree on these points—as for example, housing experts who would take the word "occupancy" to mean a far larger sum of considera tions than the narrower Insurance definition would include.

It is hoped, however, that all the propositions submitted may be allowe to follow reasonably closely the path adopted, so that our brief time (compare with the size and importance of the subject) and our best thought will b centered on a frank conference on the essence of the problem before us.

This Convention covers a large project and high aspirations for the common benefit of all of our people. It may be the beginning of a wide and concerted effort in new form to control fire waste, and it rests with us all to make this beginning as effective and instant in result as may be possible.

Has not the time come, however, for the National Government to do a great service to the country by collecting the total studies on *Fire Waste, Prevention, Protection* and *Insurance,* and formulating these suggestions and conclusions for use by the country?

While every fire is local in its origin, the sum total of all fires, or fire waste, is certainly national in effect; and the necessary method of collecting this tax through the virtually semi-public function of Insurance underwriting and the insurance policy contract constitute a truly national problem with us at this time.

I quote in conclusion on this point from the Illinois Fire Insurance Commission, viz:

> "From nearly every standpoint fire insurance seems to be interstate in its nature, perhaps more nearly so than any other business. It is based upon averages and distribution, and if we take into account large conflagrations neither average nor distribution can be intelligently applied within the limits of any single state."

As the author of the above paper, I will be glad if Director Porter will take the chair for the moment so that we may use the sufficient time at our disposal for any frank expressions of opinion about it before the exhibition of the Fire Department of Philadelphia takes place at noon.

DIRECTOR PORTER: Remember, we are one big family, and don't hesitate to express your opinions, because it is only in the frank expression of opinion that we can really arrive at the result we want to reach.

(Waits for discussion of paper. No speakers.)

It may be possible that some of you would prefer not to express your opinion at this time on so intricate a paper. These subjects will be in your hands later, and then discussion will again be in order.

At twelve o'clock to-day the Fire Department of Philadelphia will give an exhibition of the high-pressure fire system—the first in the United States. It can be viewed from the City Hall.

The Chief of the Philadelphia Fire Department will be glad to welcome any visiting chief who may be here. You may get in touch with him in Room 119.

At two o'clock this afternoon the first business session of the Convention will be held at the Bellevue-Stratford, and it is hoped that all those here will be present to participate in the proceedings.

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

this State and City; and finally had the Pa. State Fire Marshal law drafted (covering the essential provisions of such laws in other States, and the peculiar requirements—Constitutional and otherwise—necessary for this State) to the best judgment of all concerned and interested in the matter.

We secured the passage of this bill; and a substantially satisfactory amendment to a like bill for the City of Philadelphia proposed by the then administration.

When the present City administration of Philadelphia assumed office in the Fall of 1911 I interested the Mayor and the Director of Public Safety in this program; and arranged for a preliminary analysis of the City government with respect to fire control—in conjunction with Mr. Charles A. Hexamer, Secretary of the Philadelphia Fire Underwriters Association, and Dr. Jesse D. Burks, Director of the Phila. Bureau of Municipal Research, which was submitted March 16, 1912. This gave a picture of the inadequate care for the matter then existing, with all the deficiencies and confusions and tentative suggestions of the cure.

The Mayor then appointed, through the Director of Public Safety, the "Fire Prevention Commission" of nine members, with headquarters in the City Hall, which entered upon its active work November 25, 1912.

As Chairman of that Commission I arranged for financing it privately and established a salaried personnel to conduct its work as a business. Our investigations led to definite conclusions on many points—particularly on legislation and administration. We reached among others the profound conviction that continued inspection of property throughout the city was an essential for effective abatement of the evil, and that ample time and force existed in the paid Fire Department to supply continuous and adequate inspection service to this end. This policy was adopted by the Administration and put into effect January 27th with six firemen, including a captain, who were sent to New York for a brief study of such methods there. This activity, so started, gradually grew until at present there are 75 active firemen inspecting properties on a definite system. A special detailed paper on this subject, comparing it with like activities in other American cities, is in process of preparation for incorporation in the records of this Convention

With an average of 20 active firemen over a period of seven months th following results have been achieved up to October 1st, which speak fo themselves:

22,000 buildings were originally inspected and reported in accord wit an exact system.

13,500 of these buildings were reinspected to assure that the recom mendations made in the original inspections were complied with.

57,000 detail improvements were incorporated in these requirements; an it is noteworthy to state that they have all been complied with without frictio

to date. As this work in Philadelphia, planned and initiated as above described, progressed we found much valuable data and experience procurable from a few other progressive States and cities in the country. It was evident, however, that the great bulk of the country was scarcely awake to the known means whereby nation-wide actual progress in fire waste control could be effected, and only touched the high spots in their solution of the problem—and these not in common. As the cost of Insurance is admittedly a nation-wide tax, based on the average of the total fire waste of property and associated expenses and profits (not including the cost for public fire protection), it is obvious that there must be a nation-wide reduction of fire waste if the insurance cost is to be reduced; and further that loss of life and health, and from business interruption arising from this cause, can only be lowered by reducing the property loss. The United States Geological Survey (U. S. Department of the Interior), 1907, Bulletin No. 418, on "The Fire Tax and Waste of Structural Materials in the United States"; as well as the annual reports of the National Board of Fire Underwriters during the past five years; provide the best summaries of this waste;—which is now estimated at $300,000,000 per annum, or including associated costs, $450,000,000 per annum—the lower figure averaging a charge of $3.00 per capita per annum upon every man, woman and child in the country, distributed throughout everything they use in life.

Admittedly a legally enforced policy of fire prevention and protection all over the country will attack the source of fire waste; and would save, according to the soundest judgment, from one-half to two-thirds of this loss in life and property within the life of most of the people now living. This is the most important avenue of improvement in life and property loss from fire, and of reduction in insurance cost. The further possible reduction in insurance cost derivable from lowering their expense of doing business by reduction of the ruling extravagant commissions paid for selling insurance contracts can only be referred to here now.

Fire, the cause of all this trouble, is always local in origin. Under our governmental system the State is the unit of local control and can in turn regulate its cities and country districts; and so we must look to a sum total—uniform as nearly as may be—of State action, imposed in turn over all of the area of each, if we are to eliminate the bulk of American fire waste. Progress in this matter in a few States and cities does not bring reasonable or adequate relief. Large and wide betterment must be achieved to produce an average proper reduction in life and property waste, and in the cost of insurance and public fire protection.

With this experience, and these views, and my relation to the present efficient and progressive municipal government of Philadelphia, I arranged this Convention—to gather at one time and place a strong representation of the three great parties to this problem, viz:

1. Representatives of National, State and Municipal *governments.*
2. Representatives of Insurance *buyers* in the aggregate (civic, labor and business associations).
3. Representatives of Insurance *sellers* in the aggregate (Insurance Associations and Companies).

The program and tentative resolutions were—as stated before—formulated to discuss in principle every element entering into the problem, particularly from the practical legislative and administrative viewpoints. Every effort has been made to pass this in review before as wide a range of coöperative criticism—both in interest and geographically—as was able to participate in the Convention. There was some doubt in the minds of the Insurance personnel as to the final purpose of this Convention, but this doubt was solved to their satisfaction as is indicated by the N. F. P. A. correspondence incorporated in the program.

The proposed papers and discussions cover the five main physical considerations as to fire danger, viz:

Location, Construction, Protection, Equipment and *Occupancy,* in prope logical order—first considered *individually* and second *generically* (from th community standpoint), in each case—this accounting for the first ten topics The remaining five topics embrace the general problems affecting the foregoing

The proposed resolutions were intended as a whole to constitute th track along which the Convention would run, by defining the controlling principles involved seriatim, and at the same time limiting progressively th ground to be covered—so as to result in an effective interweaving of the whol without discord, gaping or overlapping. The modern "Housing" considerations must be held in full view in all such work.

The necessity for strictly limiting the time and scope of both papers an discussions was clearly demonstrated by the International Congress on Fi Waste held in London, 1903, as their Chairman definitely pointed out when adjourned.

Emphasis is laid on the fact that these resolutions are tentative and subje to final amendment in each case to express the final actual views of th Convention. The terms and definitions employed were intended to have th usual force and meaning usually employed in Insurance matters. Some our conferees may not agree on these points—as for example, housing exper who would take the word "occupancy" to mean a far larger sum of considerations than the narrower Insurance definition would include.

It is hoped, however, that all the propositions submitted may be allow to follow reasonably closely the path adopted, so that our brief time (compar with the size and importance of the subject) and our best thought will centered on a frank conference on the essence of the problem before us.

This Convention covers a large project and high aspirations for the common benefit of all of our people. It may be the beginning of a wide and concerted effort in new form to control fire waste, and it rests with us all to make this beginning as effective and instant in result as may be possible.

Has not the time come, however, for the National Government to do a great service to the country by collecting the total studies on *Fire Waste, Prevention, Protection* and *Insurance,* and formulating these suggestions and conclusions for use by the country?

While every fire is local in its origin, the sum total of all fires, or fire waste, is certainly national in effect; and the necessary method of collecting this tax through the virtually semi-public function of Insurance underwriting and the insurance policy contract constitute a truly national problem with us at this time.

I quote in conclusion on this point from the Illinois Fire Insurance Commission, viz:

> "From nearly every standpoint fire insurance seems to be interstate in its nature, perhaps more nearly so than any other business. It is based upon averages and distribution, and if we take into account large conflagrations neither average nor distribution can be intelligently applied within the limits of any single state."

As the author of the above paper, I will be glad if Director Porter will take the chair for the moment so that we may use the sufficient time at our disposal for any frank expressions of opinion about it before the exhibition of the Fire Department of Philadelphia takes place at noon.

Director Porter: Remember, we are one big family, and don't hesitate to express your opinions, because it is only in the frank expression of opinion that we can really arrive at the result we want to reach.

(Waits for discussion of paper. No speakers.)

It may be possible that some of you would prefer not to express your opinion at this time on so intricate a paper. These subjects will be in your hands later, and then discussion will again be in order.

At twelve o'clock to-day the Fire Department of Philadelphia will give an exhibition of the high-pressure fire system—the first in the United States. It can be viewed from the City Hall.

The Chief of the Philadelphia Fire Department will be glad to welcome any visiting chief who may be here. You may get in touch with him in Room 119.

At two o'clock this afternoon the first business session of the Convention will be held at the Bellevue-Stratford, and it is hoped that all those here will be present to participate in the proceedings.

The committee having this meeting in charge realizes that "all work and no play make Jack a dull boy;" so the business meetings will be interspersed with entertainment.

I would like each of you to know the other, and I think it would be desirable to have your name on your badge. Those who have not yet registered and secured badges would do well to arrange this now.

In your leisure moments there are many things in Philadelphia to see, particularly in this building; and all wishing to secure a bird's-eye view of a city of 350,000 homes may do so by taking the elevator to the top of the City Hall tower. The City Hall is open at any time to accommodate you in any way possible; and we want you to be perfectly at home. We enjoy the reputation of being a hospitable city, and if you find in your going around that we are not living up to the mark we want you to "call us down" and tell us about it, and we will do everything we can for you. Will Mr. Evans kindly resume the Chair?

Mr. Evans: If we meet promptly at two o'clock we may have a longer discussion of papers which are well worth while.

In a Convention of this sort where there is no absolute basis of representation it is obviously impossible to reach a conclusion that can be measured scientifically. It would be a hardship for those representing the city of New York to vote on an important question on a parity with an individual concern engaged in some form of manufacture. We are trying to get in this Convention the best combined judgment as a group.

Something over 300 acceptances have been received within recent days, and more will probably come in during the week. On Thursday afternoon we will probably have a large attendance from the different trade and business associations throughout the city, particularly because of the expected visit from Secretary of Commerce Redfield and his address.

If there are no other points at present I will declare the meeting adjourned until two o'clock to reconvene in the ballroom of the Bellevue-Stratford Hotel.

Adjourned.

FIRST DAY, AFTERNOON SESSION

Topic 1—"Location" (Exposure Hazard)

NOTE.—Every building, and its contents in life and property, must stand on some finite, geographical spot; and carry to, and receive from, its environing property measurable fire hazards—hence this fundamental *unit* consideration.

MR. EVANS, *Chairman:* In starting the afternoon session I will make a brief statement. We made the proposal of this Convention to the Mayor and he was in entire sympathy with its being called on the part of the city; but the city had no funds, or means of obtaining funds, for carrying it into effect or publishing the record. In view of being able to publish the record of these proceedings with the consent of the city, and the sympathetic coöperation of the officers of the National Fire Protection Association, we issued requests to something like a thousand manufacturers all over the country to aid this plan by taking paid advertisements in it. We had estimated between 300 and 400 pages of record, and added the cost of the advertising section, so that if this plan had been adopted the cost of the books would have been about 50 cents each, postage prepaid. We had planned to distribute 25,000 of them to libraries, city and State officials, and various associations having interest in the subject. We have now been asked by a number of technical papers for copies of these addresses, but have felt, under the circumstances, that they should not be released. There is a little feeling, I am inclined to think, on the part of some of these journals that we are not quite fair to them in the matter; and I wish to state to you all the circumstances in this connection. The proposal in respect to this entire matter was that whatever money was received would be used exclusively for the expenses of the Convention and record—the sources of income to be publicly acknowledged in detail; and any residue to be held as a trust fund for carrying on a National Fire Prevention movement.

I have no excuses whatever to offer with respect to this proposal, and you now have all the facts.

The first paper on the program, under the tentative resolution announced, is by Mr. McDowell, who has been very active in this sort of work for years.

THE "LEGAL BASIS FOR REGULATION OF HAZARD OF EXPOSURE TO FIRE"

By Mr. William Strite McDowell, Counsel and Secretary of the Commission for the Revision of the Building Laws of Pittsburgh, Pennsylvania

In the beginning it is well that we understand that, in so far as this paper seeks to be authoritative, it is based on "the law of the land," which, from the author's viewpoint, is that part of the United States

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

The National Fire Protection Association (which numbers in its active membership all the Stock and Mutual Boards, Bureaus, Associations, etc., as well as a large and growing number of engineering and trades associations of national scope) combines the general engineering opinion of the country on the physical facts relating to fire danger, and formulates the Standard Rules and Requirements (*Standards of Practice*) to control fire hazard of every description promulgated by the National Board of Fire Underwriters for the guidance of its associated local boards. Copies of these standards are procurable by any one from these bodies.

The N. F. P. A. is the best equipped organization in existence today in experience on the subject of fire waste and its control, and the most altruistic and progressive of these formed in large part of Insurance representatives. It is growing more and more representative of all the interests of the country touching this problem. It has been an active force in the past in spreading the general doctrine of fire prevention and promises in the near future to become a much more effective influence in this propaganda.

The 25 odd State Fire Prevention Associations in as many states, composed almost entirely of Insurance personnel, are also doing excellent work in fire-preventive inspections and public education.

So far in this country almost every fire safeguard has been a matter of *voluntary* adoption. Too much liberty has been left to the individual about constructing, protecting, equipping, occupying and managing property—to suit his greed, ignorance, indifference, or shiftlessness—thus permitting a frightful loss in life and property, resulting in a constant heavy and largely useless waste in both to the whole people.

The bulk of Insurance influence to date has exerted itself in:—

1. A protest in general terms against fire waste.

2. The preparation of physical "standards" *usable* to control the evil.

3. A system of underwriting which as a rule penalizes bad conditions only by charging a high rate on such bad conditions (which are discovered by constant inspection) and limiting the amount of such risks written. Most of this bulk underwriting is done through Agents and Brokers, now claimed to be too highly paid and inadequately regulated, whose influence is baneful to the extent that both on the average are merely eager to do the largest business at the highest commission, and hence are not interested in property loss as owner or insurer.

Losses when they occur are usually settled through Adjusters, who also need more regulation—as recent arson cases in New York and Chicago have disclosed. In the main the aim of the large majority of Insurance Underwriters is to make their business profitable. This end is best attained by collecting the largest gross premiums and saving at least half of these by

skillful business management—the method being a continued process of leaving property largely as it is found or alleged, charging the highest obtainable rate, distributing the risk, paying good Agents and Brokers liberally for securing such contracts (averaging over 20% of the gross premiums) and taking chances on fire loss, without any special provision for the life hazard. Abundant evidence may be found to substantiate the fairness of this statement:—in the Report of the Illinois Fire Insurance Commission to the Senate and House of Representatives, January 4, 1911; the Report of the Joint Committee of the Senate and Assembly of the State of New York, February 1, 1911; the Report on Examination of the New York Fire Insurance Exchange to the State of New York, July 21, 1913; the Report of the Wisconsin Legislative Fire Insurance Investigating Committee, 1913; and the Report on Incendiarism in New York City by Joseph Johnson, Fire Commissioner, December 31, 1912. All these reports are readily procurable and should be carefully studied by all interested. It may be properly stated here, however, that there is no more inherent reason why the Insurance personnel should fight fire waste unless to its best interest than applies to all other good citizens of like experience. It is the duty of the State to all its citizens to reasonably regulate this common danger.

Such is the bare outline of the machinery, physical and commercial, which insures property against fire in America. Almost all we know about the physical engineering control of fire danger has been originated and brought to its present perfection through the medium of Insurance engineers. It is enough at this date if sufficiently widely known and applied to be fully 90% efficient, hence we should now center our attention on *applying it adequately.* It must be clear why under these loosely controlling conditions we have so much fire waste of life and property in America. How can anyone question the conclusion that society should now fully measure and reckon with this common and largely controllable danger to life and property, and sternly and effectively take the situation in hand all over the country through appropriate legal regulation, both for humanitarian and economic reasons? My book "Fire Waste" elaborates the above position in a progressive series of essays which years ago forecasted this Convention.

Substantial relief from this danger can be brought about in any state or city by any group of men, or almost by any one man, who will devote time, money, purpose and intelligence to this end.

It is pertinent here to briefly review recent history on this subject in Pennsylvania and Philadelphia to make this point clear—although this closely touches my own activities.

In the Spring of 1911 I interested the City Club, the local Bureau of Municipal Research, Chamber of Commerce, Board of Trade and a number of general citizen agencies here in the necessity for fire waste control in

this State and City; and finally had the Pa. State Fire Marshal law drafted (covering the essential provisions of such laws in other States, and the peculiar requirements—Constitutional and otherwise—necessary for this State) to the best judgment of all concerned and interested in the matter.

We secured the passage of this bill; and a substantially satisfactory amendment to a like bill for the City of Philadelphia proposed by the then administration.

When the present City administration of Philadelphia assumed office in the Fall of 1911 I interested the Mayor and the Director of Public Safety in this program; and arranged for a preliminary analysis of the City government with respect to fire control—in conjunction with Mr. Charles A. Hexamer, Secretary of the Philadelphia Fire Underwriters Association, and Dr. Jesse D. Burks, Director of the Phila. Bureau of Municipal Research, which was submitted March 16, 1912. This gave a picture of the inadequate care for the matter then existing, with all the deficiencies and confusions and tentative suggestions of the cure.

The Mayor then appointed, through the Director of Public Safety, the "Fire Prevention Commission" of nine members, with headquarters in the City Hall, which entered upon its active work November 25, 1912.

As Chairman of that Commission I arranged for financing it privately and established a salaried personnel to conduct its work as a business. Our investigations led to definite conclusions on many points—particularly on legislation and administration. We reached among others the profound conviction that continued inspection of property throughout the city was an essential for effective abatement of the evil, and that ample time and force existed in the paid Fire Department to supply continuous and adequate inspection service to this end. This policy was adopted by the Administration and put into effect January 27th with six firemen, including a captain, who were sent to New York for a brief study of such methods there. This activity, so started, gradually grew until at present there are 75 active firemen inspecting properties on a definite system. A special detailed paper on this subject, comparing it with like activities in other American cities, is in process of preparation for incorporation in the records of this Convention.

With an average of 20 active firemen over a period of seven months the following results have been achieved up to October 1st, which speak for themselves:

22,000 buildings were originally inspected and reported in accord with an exact system.

13,500 of these buildings were reinspected to assure that the recommendations made in the original inspections were complied with.

57,000 detail improvements were incorporated in these requirements; and it is noteworthy to state that they have all been complied with without friction

to date. As this work in Philadelphia, planned and initiated as above described, progressed we found much valuable data and experience procurable from a few other progressive States and cities in the country. It was evident, however, that the great bulk of the country was scarcely awake to the known means whereby nation-wide actual progress in fire waste control could be effected, and only touched the high spots in their solution of the problem—and these not in common. As the cost of Insurance is admittedly a nation-wide tax, based on the average of the total fire waste of property and associated expenses and profits (not including the cost for public fire protection), it is obvious that there must be a nation-wide reduction of fire waste if the insurance cost is to be reduced; and further that loss of life and health, and from business interruption arising from this cause, can only be lowered by reducing the property loss. The United States Geological Survey (U. S. Department of the Interior), 1907, Bulletin No. 418, on "The Fire Tax and Waste of Structural Materials in the United States"; as well as the annual reports of the National Board of Fire Underwriters during the past five years; provide the best summaries of this waste;—which is now estimated at $300,000,000 per annum, or including associated costs, $450,000,000 per annum—the lower figure averaging a charge of $3.00 per capita per annum upon every man, woman and child in the country, distributed throughout everything they use in life.

Admittedly a legally enforced policy of fire prevention and protection all over the country will attack the source of fire waste; and would save, according to the soundest judgment, from one-half to two-thirds of this loss in life and property within the life of most of the people now living. This is the most important avenue of improvement in life and property loss from fire and of reduction in insurance cost. The further possible reduction in insurance cost derivable from lowering their expense of doing business by reduction of the ruling extravagant commissions paid for selling insurance contracts can only be referred to here now.

Fire, the cause of all this trouble, is always local in origin. Under our governmental system the State is the unit of local control and can in turn regulate its cities and country districts; and so we must look to a sum total—uniform as nearly as may be—of State action, imposed in turn over all of the area of each, if we are to eliminate the bulk of American fire waste. Progress in this matter in a few States and cities does not bring reasonable or adequate relief. Large and wide betterment must be achieved to produce an average proper reduction in life and property waste, and in the cost of insurance and public fire protection.

With this experience, and these views, and my relation to the present efficient and progressive municipal government of Philadelphia, I arranged this Convention—to gather at one time and place a strong representation of the three great parties to this problem, viz:

1. Representatives of National, State and Municipal *governments.*

2. Representatives of Insurance *buyers* in the aggregate (civic, labor and business associations).

3. Representatives of Insurance *sellers* in the aggregate (Insurance Associations and Companies).

The program and tentative resolutions were—as stated before—formulated to discuss in principle every element entering into the problem, particularly from the practical legislative and administrative viewpoints. Every effort has been made to pass this in review before as wide a range of coöperative criticism—both in interest and geographically—as was able to participate in the Convention. There was some doubt in the minds of the Insurance personnel as to the final purpose of this Convention, but this doubt was solved to their satisfaction as is indicated by the N. F. P. A. correspondence incorporated in the program.

The proposed papers and discussions cover the five main physical considerations as to fire danger, viz:

Location, Construction, Protection, Equipment and *Occupancy,* in proper logical order—first considered *individually* and second *generically* (from the community standpoint), in each case—this accounting for the first ten topics. The remaining five topics embrace the general problems affecting the foregoing.

The proposed resolutions were intended as a whole to constitute the track along which the Convention would run, by defining the controlling principles involved seriatim, and at the same time limiting progressively the ground to be covered—so as to result in an effective interweaving of the whole without discord, gaping or overlapping. The modern "Housing" considerations must be held in full view in all such work.

The necessity for strictly limiting the time and scope of both papers and discussions was clearly demonstrated by the International Congress on Fire Waste held in London, 1903, as their Chairman definitely pointed out when it adjourned.

Emphasis is laid on the fact that these resolutions are tentative and subject to final amendment in each case to express the final actual views of the Convention. The terms and definitions employed were intended to have the usual force and meaning usually employed in Insurance matters. Some of our conferees may not agree on these points—as for example, housing experts who would take the word "occupancy" to mean a far larger sum of considerations than the narrower Insurance definition would include.

It is hoped, however, that all the propositions submitted may be allowed to follow reasonably closely the path adopted, so that our brief time (compared with the size and importance of the subject) and our best thought will be centered on a frank conference on the essence of the problem before us.

This Convention covers a large project and high aspirations for the common benefit of all of our people. It may be the beginning of a wide and concerted effort in new form to control fire waste, and it rests with us all to make this beginning as effective and instant in result as may be possible.

Has not the time come, however, for the National Government to do a great service to the country by collecting the total studies on *Fire Waste, Prevention, Protection* and *Insurance,* and formulating these suggestions and conclusions for use by the country?

While every fire is local in its origin, the sum total of all fires, or fire waste, is certainly national in effect; and the necessary method of collecting this tax through the virtually semi-public function of Insurance underwriting and the insurance policy contract constitute a truly national problem with us at this time.

I quote in conclusion on this point from the Illinois Fire Insurance Commission, viz:

> "From nearly every standpoint fire insurance seems to be interstate in its nature, perhaps more nearly so than any other business. It is based upon averages and distribution, and if we take into account large conflagrations neither average nor distribution can be intelligently applied within the limits of any single state."

As the author of the above paper, I will be glad if Director Porter will take the chair for the moment so that we may use the sufficient time at our disposal for any frank expressions of opinion about it before the exhibition of the Fire Department of Philadelphia takes place at noon.

DIRECTOR PORTER: Remember, we are one big family, and don't hesitate to express your opinions, because it is only in the frank expression of opinion that we can really arrive at the result we want to reach.

(Waits for discussion of paper. No speakers.)

It may be possible that some of you would prefer not to express your opinion at this time on so intricate a paper. These subjects will be in your hands later, and then discussion will again be in order.

At twelve o'clock to-day the Fire Department of Philadelphia will give an exhibition of the high-pressure fire system—the first in the United States. It can be viewed from the City Hall.

The Chief of the Philadelphia Fire Department will be glad to welcome any visiting chief who may be here. You may get in touch with him in Room 119.

At two o'clock this afternoon the first business session of the Convention will be held at the Bellevue-Stratford, and it is hoped that all those here will be present to participate in the proceedings.

The committee having this meeting in charge realizes that "all work and no play make Jack a dull boy;" so the business meetings will be interspersed with entertainment.

I would like each of you to know the other, and I think it would be desirable to have your name on your badge. Those who have not yet registered and secured badges would do well to arrange this now.

In your leisure moments there are many things in Philadelphia to see, particularly in this building; and all wishing to secure a bird's-eye view of a city of 350,000 homes may do so by taking the elevator to the top of the City Hall tower. The City Hall is open at any time to accommodate you in any way possible; and we want you to be perfectly at home. We enjoy the reputation of being a hospitable city, and if you find in your going around that we are not living up to the mark we want you to "call us down" and tell us about it, and we will do everything we can for you. Will Mr. Evans kindly resume the Chair?

MR. EVANS: If we meet promptly at two o'clock we may have a longer discussion of papers which are well worth while.

In a Convention of this sort where there is no absolute basis of representation it is obviously impossible to reach a conclusion that can be measured scientifically. It would be a hardship for those representing the city of New York to vote on an important question on a parity with an individual concern engaged in some form of manufacture. We are trying to get in this Convention the best combined judgment as a group.

Something over 300 acceptances have been received within recent days, and more will probably come in during the week. On Thursday afternoon we will probably have a large attendance from the different trade and business associations throughout the city, particularly because of the expected visit from Secretary of Commerce Redfield and his address.

If there are no other points at present I will declare the meeting adjourned until two o'clock to reconvene in the ballroom of the Bellevue-Stratford Hotel.

Adjourned.

Topic 1—"Location" (Exposure Hazard)

NOTE.—Every building, and its contents in life and property, must stand on some finite, geographical spot; and carry to, and receive from, its environing property measurable fire hazards—hence this fundamental *unit* consideration.

MR. EVANS, *Chairman:* In starting the afternoon session I will make a brief statement. We made the proposal of this Convention to the Mayor and he was in entire sympathy with its being called on the part of the city; but the city had no funds, or means of obtaining funds, for carrying it into effect or publishing the record. In view of being able to publish the record of these proceedings with the consent of the city, and the sympathetic coöperation of the officers of the National Fire Protection Association, we issued requests to something like a thousand manufacturers all over the country to aid this plan by taking paid advertisements in it. We had estimated between 300 and 400 pages of record, and added the cost of the advertising section, so that if this plan had been adopted the cost of the books would have been about 50 cents each, postage prepaid. We had planned to distribute 25,000 of them to libraries, city and State officials, and various associations having interest in the subject. We have now been asked by a number of technical papers for copies of these addresses, but have felt, under the circumstances, that they should not be released. There is a little feeling, I am inclined to think, on the part of some of these journals that we are not quite fair to them in the matter; and I wish to state to you all the circumstances in this connection. The proposal in respect to this entire matter was that whatever money was received would be used exclusively for the expenses of the Convention and record—the sources of income to be publicly acknowledged in detail; and any residue to be held as a trust fund for carrying on a National Fire Prevention movement.

I have no excuses whatever to offer with respect to this proposal, and you now have all the facts.

The first paper on the program, under the tentative resolution announced, is by Mr. McDowell, who has been very active in this sort of work for years.

THE "LEGAL BASIS FOR REGULATION OF HAZARD OF EXPOSURE TO FIRE"

By Mr. William Strite McDowell, Counsel and Secretary of the Commission for the Revision of the Building Laws of Pittsburgh, Pennsylvania

In the beginning it is well that we understand that, in so far as this paper seeks to be authoritative, it is based on "the law of the land," which, from the author's viewpoint, is that part of the United States

this State and City; and finally had the Pa. State Fire Marshal law drafted (covering the essential provisions of such laws in other States, and the peculiar requirements—Constitutional and otherwise—necessary for this State) to the best judgment of all concerned and interested in the matter.

We secured the passage of this bill; and a substantially satisfactory amendment to a like bill for the City of Philadelphia proposed by the then administration.

When the present City administration of Philadelphia assumed office in the Fall of 1911 I interested the Mayor and the Director of Public Safety in this program; and arranged for a preliminary analysis of the City government with respect to fire control—in conjunction with Mr. Charles A. Hexamer, Secretary of the Philadelphia Fire Underwriters Association, and Dr. Jesse D. Burks, Director of the Phila. Bureau of Municipal Research, which was submitted March 16, 1912. This gave a picture of the inadequate care for the matter then existing, with all the deficiencies and confusions and tentative suggestions of the cure.

The Mayor then appointed, through the Director of Public Safety, the "Fire Prevention Commission" of nine members, with headquarters in the City Hall, which entered upon its active work November 25, 1912.

As Chairman of that Commission I arranged for financing it privately and established a salaried personnel to conduct its work as a business. Our investigations led to definite conclusions on many points—particularly on legislation and administration. We reached among others the profound conviction that continued inspection of property throughout the city was an essential for effective abatement of the evil, and that ample time and force existed in the paid Fire Department to supply continuous and adequate inspection service to this end. This policy was adopted by the Administration and put into effect January 27th with six firemen, including a captain, who were sent to New York for a brief study of such methods there. This activity, so started, gradually grew until at present there are 75 active firemen inspecting properties on a definite system. A special detailed paper on this subject, comparing it with like activities in other American cities, is in process of preparation for incorporation in the records of this Convention.

With an average of 20 active firemen over a period of seven months the following results have been achieved up to October 1st, which speak for themselves:

22,000 buildings were originally inspected and reported in accord with an exact system.

13,500 of these buildings were reinspected to assure that the recommendations made in the original inspections were complied with.

57,000 detail improvements were incorporated in these requirements; and it is noteworthy to state that they have all been complied with without friction

to date. As this work in Philadelphia, planned and initiated as above described, progressed we found much valuable data and experience procurable from a few other progressive States and cities in the country. It was evident, however, that the great bulk of the country was scarcely awake to the known means whereby nation-wide actual progress in fire waste control could be effected, and only touched the high spots in their solution of the problem—and these not in common. As the cost of Insurance is admittedly a nation-wide tax, based on the average of the total fire waste of property and associated expenses and profits (not including the cost for public fire protection), it is obvious that there must be a nation-wide reduction of fire waste if the insurance cost is to be reduced; and further that loss of life and health, and from business interruption arising from this cause, can only be lowered by reducing the property loss. The United States Geological Survey (U. S. Department of the Interior), 1907, Bulletin No. 418, on "The Fire Tax and Waste of Structural Materials in the United States"; as well as the annual reports of the National Board of Fire Underwriters during the past five years; provide the best summaries of this waste;—which is now estimated at $300,000,000 per annum, or including associated costs, $450,000,000 per annum—the lower figure averaging a charge of $3.00 per capita per annum upon every man, woman and child in the country, distributed throughout everything they use in life.

Admittedly a legally enforced policy of fire prevention and protection all over the country will attack the source of fire waste; and would save, according to the soundest judgment, from one-half to two-thirds of this loss in life and property within the life of most of the people now living. This is the most important avenue of improvement in life and property loss from fire, and of reduction in insurance cost. The further possible reduction in insurance cost derivable from lowering their expense of doing business by reduction of the ruling extravagant commissions paid for selling insurance contracts can only be referred to here now.

Fire, the cause of all this trouble, is always local in origin. Under our Governmental system the State is the unit of local control and can in turn regulate its cities and country districts; and so we must look to a sum total—uniform as nearly as may be—of State action, imposed in turn over all of the area of each, if we are to eliminate the bulk of American fire waste. Progress in this matter in a few States and cities does not bring reasonable or adequate relief. Large and wide betterment must be achieved to produce an average proper reduction in life and property waste, and in the cost of insurance and public fire protection.

With this experience, and these views, and my relation to the present efficient and progressive municipal government of Philadelphia, I arranged this Convention—to gather at one time and place a strong representation of the three great parties to this problem, viz:

this State and City; and finally had the Pa. State Fire Marshal law drafted (covering the essential provisions of such laws in other States, and the peculiar requirements—Constitutional and otherwise—necessary for this State) to the best judgment of all concerned and interested in the matter.

We secured the passage of this bill; and a substantially satisfactory amendment to a like bill for the City of Philadelphia proposed by the then administration.

When the present City administration of Philadelphia assumed office in the Fall of 1911 I interested the Mayor and the Director of Public Safety in this program; and arranged for a preliminary analysis of the City government with respect to fire control—in conjunction with Mr. Charles A. Hexamer, Secretary of the Philadelphia Fire Underwriters Association, and Dr. Jesse D. Burks, Director of the Phila. Bureau of Municipal Research, which was submitted March 16, 1912. This gave a picture of the inadequate care for the matter then existing, with all the deficiencies and confusions and tentative suggestions of the cure.

The Mayor then appointed, through the Director of Public Safety, the "Fire Prevention Commission" of nine members, with headquarters in the City Hall, which entered upon its active work November 25, 1912.

As Chairman of that Commission I arranged for financing it privately and established a salaried personnel to conduct its work as a business. Our investigations led to definite conclusions on many points—particularly on legislation and administration. We reached among others the profound conviction that continued inspection of property throughout the city was an essential for effective abatement of the evil, and that ample time and force existed in the paid Fire Department to supply continuous and adequate inspection service to this end. This policy was adopted by the Administration and put into effect January 27th with six firemen, including a captain, who were sent to New York for a brief study of such methods there. This activity, so started, gradually grew until at present there are 75 active firemen inspecting properties on a definite system. A special detailed paper on this subject, comparing it with like activities in other American cities, is in process of preparation for incorporation in the records of this Convention.

With an average of 20 active firemen over a period of seven months the following results have been achieved up to October 1st, which speak for themselves:

22,000 buildings were originally inspected and reported in accord with an exact system.

13,500 of these buildings were reinspected to assure that the recommendations made in the original inspections were complied with.

57,000 detail improvements were incorporated in these requirements; and it is noteworthy to state that they have all been complied with without friction

to date. As this work in Philadelphia, planned and initiated as above described, progressed we found much valuable data and experience procurable from a few other progressive States and cities in the country. It was evident, however, that the great bulk of the country was scarcely awake to the known means whereby nation-wide actual progress in fire waste control could be effected, and only touched the high spots in their solution of the problem—and these not in common. As the cost of Insurance is admittedly a nation-wide tax, based on the average of the total fire waste of property and associated expenses and profits (not including the cost for public fire protection), it is obvious that there must be a nation-wide reduction of fire waste if the insurance cost is to be reduced; and further that loss of life and health, and from business interruption arising from this cause, can only be lowered by reducing the property loss. The United States Geological Survey (U. S. Department of the Interior), 1907, Bulletin No. 418, on "The Fire Tax and Waste of Structural Materials in the United States"; as well as the annual reports of the National Board of Fire Underwriters during the past five years; provide the best summaries of this waste;—which is now estimated at $300,000,000 per annum, or including associated costs, $450,000,000 per annum—the lower figure averaging a charge of $3.00 per capita per annum upon every man, woman and child in the country, distributed throughout everything they use in life.

Admittedly a legally enforced policy of fire prevention and protection all over the country will attack the source of fire waste; and would save, according to the soundest judgment, from one-half to two-thirds of this loss in life and property within the life of most of the people now living. This is the most important avenue of improvement in life and property loss from fire, and of reduction in insurance cost. The further possible reduction in insurance cost derivable from lowering their expense of doing business by reduction of the ruling extravagant commissions paid for selling insurance contracts can only be referred to here now.

Fire, the cause of all this trouble, is always local in origin. Under our Governmental system the State is the unit of local control and can in turn regulate its cities and country districts; and so we must look to a sum total—uniform as nearly as may be—of State action, imposed in turn over all of the area of each, if we are to eliminate the bulk of American fire waste. Progress in this matter in a few States and cities does not bring reasonable or adequate relief. Large and wide betterment must be achieved to produce an average proper reduction in life and property waste, and in the cost of insurance and public fire protection.

With this experience, and these views, and my relation to the present efficient and progressive municipal government of Philadelphia, I arranged this Convention—to gather at one time and place a strong representation of the three great parties to this problem, viz:

1. Representatives of National, State and Municipal *governments.*
2. Representatives of Insurance *buyers* in the aggregate (civic, labor and business associations).
3. Representatives of Insurance *sellers* in the aggregate (Insurance Associations and Companies).

The program and tentative resolutions were—as stated before—formulated to discuss in principle every element entering into the problem, particularly from the practical legislative and administrative viewpoints. Every effort has been made to pass this in review before as wide a range of coöperative criticism—both in interest and geographically—as was able to participate in the Convention. There was some doubt in the minds of the Insurance personnel as to the final purpose of this Convention, but this doubt was solved to their satisfaction as is indicated by the N. F. P. A. correspondence incorporated in the program.

The proposed papers and discussions cover the five main physical considerations as to fire danger, viz:

Location, Construction, Protection, Equipment and *Occupancy,* in proper logical order—first considered *individually* and second *generically* (from the community standpoint), in each case—this accounting for the first ten topics. The remaining five topics embrace the general problems affecting the foregoing.

The proposed resolutions were intended as a whole to constitute the track along which the Convention would run, by defining the controlling principles involved seriatim, and at the same time limiting progressively the ground to be covered—so as to result in an effective interweaving of the whole without discord, gaping or overlapping. The modern "Housing" considerations must be held in full view in all such work.

The necessity for strictly limiting the time and scope of both papers and discussions was clearly demonstrated by the International Congress on Fire Waste held in London, 1903, as their Chairman definitely pointed out when it adjourned.

Emphasis is laid on the fact that these resolutions are tentative and subject to final amendment in each case to express the final actual views of the Convention. The terms and definitions employed were intended to have the usual force and meaning usually employed in Insurance matters. Some of our conferees may not agree on these points—as for example, housing experts who would take the word "occupancy" to mean a far larger sum of considerations than the narrower Insurance definition would include.

It is hoped, however, that all the propositions submitted may be allowed to follow reasonably closely the path adopted, so that our brief time (compared with the size and importance of the subject) and our best thought will be centered on a frank conference on the essence of the problem before us.

This Convention covers a large project and high aspirations for the common benefit of all of our people. It may be the beginning of a wide and concerted effort in new form to control fire waste, and it rests with us all to make this beginning as effective and instant in result as may be possible.

Has not the time come, however, for the National Government to do a great service to the country by collecting the total studies on *Fire Waste, Prevention, Protection* and *Insurance,* and formulating these suggestions and conclusions for use by the country?

While every fire is local in its origin, the sum total of all fires, or fire waste, is certainly national in effect; and the necessary method of collecting this tax through the virtually semi-public function of Insurance underwriting and the insurance policy contract constitute a truly national problem with us at this time.

I quote in conclusion on this point from the Illinois Fire Insurance Commission, viz:

> "From nearly every standpoint fire insurance seems to be interstate in its nature, perhaps more nearly so than any other business. It is based upon averages and distribution, and if we take into account large conflagrations neither average nor distribution can be intelligently applied within the limits of any single state."

As the author of the above paper, I will be glad if Director Porter will take the chair for the moment so that we may use the sufficient time at our disposal for any frank expressions of opinion about it before the exhibition of the Fire Department of Philadelphia takes place at noon.

DIRECTOR PORTER: Remember, we are one big family, and don't hesitate to express your opinions, because it is only in the frank expression of opinion that we can really arrive at the result we want to reach.

(Waits for discussion of paper. No speakers.)

It may be possible that some of you would prefer not to express your opinion at this time on so intricate a paper. These subjects will be in your hands later, and then discussion will again be in order.

At twelve o'clock to-day the Fire Department of Philadelphia will give an exhibition of the high-pressure fire system—the first in the United States. It can be viewed from the City Hall.

The Chief of the Philadelphia Fire Department will be glad to welcome any visiting chief who may be here. You may get in touch with him in Room 119.

At two o'clock this afternoon the first business session of the Convention will be held at the Bellevue-Stratford, and it is hoped that all those here will be present to participate in the proceedings.

The committee having this meeting in charge realizes that "all work and no play make Jack a dull boy;" so the business meetings will be interspersed with entertainment.

I would like each of you to know the other, and I think it would be desirable to have your name on your badge. Those who have not yet registered and secured badges would do well to arrange this now.

In your leisure moments there are many things in Philadelphia to see, particularly in this building; and all wishing to secure a bird's-eye view of a city of 350,000 homes may do so by taking the elevator to the top of the City Hall tower. The City Hall is open at any time to accommodate you in any way possible; and we want you to be perfectly at home. We enjoy the reputation of being a hospitable city, and if you find in your going around that we are not living up to the mark we want you to "call us down" and tell us about it, and we will do everything we can for you. Will Mr. Evans kindly resume the Chair?

MR. EVANS: If we meet promptly at two o'clock we may have a longer discussion of papers which are well worth while.

In a Convention of this sort where there is no absolute basis of representation it is obviously impossible to reach a conclusion that can be measured scientifically. It would be a hardship for those representing the city of New York to vote on an important question on a parity with an individual concern engaged in some form of manufacture. We are trying to get in this Convention the best combined judgment as a group.

Something over 300 acceptances have been received within recent days, and more will probably come in during the week. On Thursday afternoon we will probably have a large attendance from the different trade and business associations throughout the city, particularly because of the expected visit from Secretary of Commerce Redfield and his address.

If there are no other points at present I will declare the meeting adjourned until two o'clock to reconvene in the ballroom of the Bellevue-Stratford Hotel.

Adjourned.

Topic 1—"Location" (Exposure Hazard)

NOTE.—Every building, and its contents in life and property, must stand on some finite, geographical spot; and carry to, and receive from, its environing property measurable fire hazards—hence this fundamental *unit* consideration.

MR. EVANS, *Chairman:* In starting the afternoon session I will make a brief statement. We made the proposal of this Convention to the Mayor and he was in entire sympathy with its being called on the part of the city; but the city had no funds, or means of obtaining funds, for carrying it into effect or publishing the record. In view of being able to publish the record of these proceedings with the consent of the city, and the sympathetic coöperation of the officers of the National Fire Protection Association, we issued requests to something like a thousand manufacturers all over the country to aid this plan by taking paid advertisements in it. We had estimated between 300 and 400 pages of record, and added the cost of the advertising section, so that if this plan had been adopted the cost of the books would have been about 50 cents each, postage prepaid. We had planned to distribute 25,000 of them to libraries, city and State officials, and various associations having interest in the subject. We have now been asked by a number of technical papers for copies of these addresses, but have felt, under the circumstances, that they should not be released. There is a little feeling, I am inclined to think, on the part of some of these journals that we are not quite fair to them in the matter; and I wish to state to you all the circumstances in this connection. The proposal in respect to this entire matter was that whatever money was received would be used exclusively for the expenses of the Convention and record—the sources of income to be publicly acknowledged in detail; and any residue to be held as a trust fund for carrying on a National Fire Prevention movement.

I have no excuses whatever to offer with respect to this proposal, and you now have all the facts.

The first paper on the program, under the tentative resolution announced, is by Mr. McDowell, who has been very active in this sort of work for years.

THE "LEGAL BASIS FOR REGULATION OF HAZARD OF EXPOSURE TO FIRE"

By Mr. William Strite McDowell, Counsel and Secretary of the Commission for the Revision of the Building Laws of Pittsburgh, Pennsylvania

In the beginning it is well that we understand that, in so far as this paper seeks to be authoritative, it is based on "the law of the land," which, from the author's viewpoint, is that part of the United States

within the confines of Pennsylvania. While the appellate courts of all States may not agree with the opinions here expressed, we shall endeavor not to wander from the line of decisions of the Federal Supreme Court.

Civilization imposes burdens; however it also distributes the load; and each of us is bearing a part of the financial loss due to city-wide conflagrations, whether in San Francisco or Chelsea, Mass., and if we have to pay the tax we ought to know at least why it is imposed.

We know that every fire has its origin in some particular spot. For a brief time it may be well localized. If not controlled it may soon spread and become general in a distant vicinity, and the damage to be suffered depends largely upon the character of its environs. Mrs. O'Leary's cow found with her foot a lighted lantern in a particular spot and that was the identical place where Chicago began to burn, while if Mrs. Dumbaugh's cow had had a similar experience in her barn in Cold Springs township, Lebanon county, Pennsylvania, not more than twenty-nine souls would have been endangered if the flames had swept over the entire township.

A fire due to spontaneous combustion always occurs at a given place where the conditions produce the result, and it may not become coextensive with a block or even an entire building. When produced by an incendiary it may extend immediately over an entire floor.

Fires may be accidental, but these preclude design or habit and refer to a definite point, and not to a chain of circumstances which might have occurred at any place.

At common law, though a man by accident set fire to his own property and thereby burned his neighbor's house, he was liable for the damage done even though the cause of the accident was the act of his child, servant, employee or agent. However, by the statute of 6th Anne (1707) he was relieved from liability for the negligence or unauthorized act of his agent, servant or employee, as it came to be considered that the loss of his own property was a sufficient punishment.

In the time of Blackstone the law was changed by relieving a party from liability for accidental fire, whether it was the result of his own act or that of his servant, agent or employee; and such is the law of Pennsylvania. He is only liable where the fire is the direct or proximate result of his own intentional and negligent act or that of his servant, agent or employee.

Negligence is defined as "absence of care under the circumstances." In case of a tenant under a lease containing a covenant to repair, the tenant is bound to reconstruct the building on the demised premises whether the fire which destroyed the same be due to an accidental cause, his own negligence, or the negligence of others. However, under the form of lease now in general use the tenant is only liable for ordinary repairs, and in case of destruction by fire may be held for the rent for the balance of the term.

By the terms of the Code Napoleon now in force in France, "the tenant is responsible for fire on his own premises unless he can prove that the fire was caused by something beyond his control, by some fault in the building, or that the fire was communicated by flames from another building. If there are a number of tenants they are alike responsible unless they can prove that the fire caught in the apartment occupied by one of them, in which case that one alone is responsible; unless some of them prove that the fire did not begin in their apartment, in which case they are not responsible."

In Berlin every landlord is compelled to insure his property, even while in the course of construction, in a municipal corporation known as the City Fire Insurance Association, to the amount fixed by the appraisers, which is generally equal to the mortgageable value. In Belgium the tenant is required to insure the property for the benefit of the landlord, and in the event of the destruction by fire of a building the indemnity due to the tenant is payable to the owner of the building to the exclusion of the creditors of the party insured.

It will be observed that in France there is a presumption of negligence from the fact of the fire, and the placing of the burden in this manner causes the people to be very careful to prevent fire. The thrifty ones do not fail to have all such liabilities covered by insurance, with the result that the insurance rates are mere fractions of ours. In Pennsylvania and other American States there is no such presumption of negligence and the burden of proving it is always on the party alleging negligence, with but few exceptions to the rule, as in case of a common carrier, who is generally considered an insurer.

Whether a given fire is due to negligence or not is a fact for the jury to determine in any well-litigated case; although the legislature, by requiring parties to conform to certain necessary regulations to prevent fire or in default thereof render inaffective their defense of accident, could reduce the annual losses to a large degree.

Fire due to negligence may be the result of a careless habit and thereby more often recur, and the doctrine of proximate cause has in our State often been construed to exempt parties responsible from liability where in other States they would be legally liable.

The remedy must be locally applied if the great fires are to be prevented as the building police enforce the Berlin law so as to compel safe and fire-resistant construction. Our local authorities must secure conformity to the building regulations if we are to reduce our hazard.

This is a matter of State regulation and the State may by its legislature enact the laws or delegate to its agent, the municipality, power to enact ordinances, to reduce the loss of life and property by fire; and such regulations are the proper subject for the exercise by the State of its undefinable right to compel the observance of certain rules of safety by one or many for the general good of all, known as the "police power," or, as stated by another, "the power of each State (exercised directly by its legislature or through its municipalities) for the suppression or regulation of whatever is injurious to the peace, health, morality, general intelligence and thrift of the community and its internal safety"; and the only limits to the exercise of the authority desired are the prohibitions of the fifth and fourteenth amendments to the Constitution of the United States and the reserved rights of the people as declared in the Constitution of Pennsylvania. The Federal amendments prohibit either the State or the individual from depriving any person of life, liberty or property without due process of law, or the taking of private property for public use without just compensation. The same rights are reserved by the people from the legislative power which is otherwise vested in the general assembly.

Where a series of acts become a public nuisance, such as a habit of the incendiary or continued carelessness resulting in frequent fire, the private individual who is aggrieved thereby has a legal right to abate it, even though the same power be vested in proper municipal or State officers who could with less doubt of authority proceed to abate the same in accordance with legislative sanction previously given. It has been stated that the continual threat of injury to property is itself such an injury as gives rise to an action at law to prevent it.

The maxim of the common law, that a person has only the right to use his own property to the extent that he does not thereby injure that of his neighbors, has since the days of the Roman law been a fundamental principle with respect to real as well as personal property. To this it was attempted to attach the other principle "that for every wrong there is a remedy." This, however, led to constant litigation arising out of the fact that one man's property may be injured by competition springing out of a new use of his neighbor's property, as where the ferryman's right to navigate the stream was rendered valueless by another constructing a bridge near the same crossing. Such injuries, while vexatious, would be the basis of innumerable and multifarious actions but for the other principle brought into common use concurrent with the police power of "damage without injury." The last-mentioned doctrine has in recent years, according to the decisions of the appellate courts, justified or relieved from damage many negligent and "grasping" property owners who destroyed their neighbors' property in order to develop or more economically use their own property. Such decisions are contrary to the course of the common law and violative of the principles of sound equity.

Abraham Lincoln once said, "The Supreme Court follows the election returns," and our justices of the higher courts during the past few years have been more careful to protect human rights than the right of property regardless of human rights, and in construing the statutes have considered the phrases "against the public policy" and "to promote the general welfare" as integral and interdicting part of the Constitution.

Human life is concerned with practically every exposure of property to the risk of fire, and it therefore behooves the real philanthropist to consider in a serious manner the life hazard of fire due to faulty or negligent construction and maintenance of real property. It has long been held that great conflagrations come within the terms mentioned by Blackstone as release of all liabilities for damage, to wit, "acts of God" and "the public enemy." The latter may now be held to apply only in time of actual warfare, while the former, for an equally good reason, includes only earthquakes and lightning. All other fires, however occasioned, are due to preventable causes.

Within the memory of the youngest of us the method of prevention of the ravages of some of the common and deadly diseases has been ascertained and effectively applied, where less than half a century ago such ravages were called "plagues" and included within the term "acts of God." The active and moving cause of many fires listed under the head "causes not known" are now within the ken of the learned investigator; and certain fundamental causes of incendiarism are found to be financial embarrassment, crime and the desire to hide it, hope of gain. and subnormal mentality. All other causes of fire come within the scope of negligence, active or passive, in operation or construction. As the open window in the closed and unguarded residence is an invitation to the burglar, so is the large insurance policy to an embarrassed merchant.

It has been held that the States have power to prohibit the erection of slaughter houses, laundries and powder mills in certain localities; and also to segregate certain kinds of establishments in a particular part of a city, though the owners of other property within said part or district are damaged by having their property located within the boundaries thereof.

Since the early days of this Commonwealth regulations prescribing fire limits in boroughs and cities within which wood or frame buildings should not be erected have been held to be valid; and where the borough officials tore down a frame building erected in violation of an ordinance forbidding the same, our Supreme Court has relieved said officials from all liability for damage on the grounds that they were acting pursuant to law abating a public nuisance. But where the borough ordinance prohibited the erection of any frame buildings within the corporate limits it has been held that said ordinance was invalid as the requirement was unreasonable. The rule is that "so long as the action has a reasonable relation to the power belonging to the local legislature and is not so arbitrary or capricious as to be a deprivation of due process of law it is not to be interfered with."

I contend that an ordinance requiring fire-resistant construction and defining the same for a thickly congested part of the city would be valid, as it would properly be included within the police power, which is said to be "one of the most essential powers," at times most necessary, and always one of the least limitable powers of government; "but it necessarily has its limits and must stop when it encounters the prohibitions of the Constitution."

To prevent the spread of fire within a building the use of automatic sprinklers has been required by many cities where a large and unrestricted floor space is used for exhibition or storage of combustible materials, or that said space be divided as an alternative into smaller rooms by fire-resistant partitions. In determining the legality of such requirements a classification of a risk is necessary and "the legislature is permitted to take a reasonable classification and before the court can interfere with the exercise of its sound discretion it (the court) must be able to say that there is no fair reason for the law that would not require with equal force its extension to others whom it leaves untouched." Under this construction a law fixing the width of entries to certain kinds of coal mines has been declared constitutional.

As the courts have construed as valid building regulations requiring brick walls to prevent the passage of fire from one building to another, it would seem only reasonable and a fair classification if it required that window and door openings on narrow streets or alleys should be enclosed by fire-resistant frames and sash and wireglass (or equal) as a retarder of the spread of fire. Some cities have already so provided. The limit on this question of regulation is defined by the answer to the question of "whether there is a taking of property by due process of law," as it has been held that the limiting of the height of buildings or the fixing of the building line different from the street line is the "taking of property" and unconstitutional unless "provision for compensation be made." The owner receives no compensation for property taken under the police power, except the general good to the public and to all the property in the vicinity, including his own, and he is said to have suffered "damage without injury."

Again reverting to Blackstone we find that the police power is "that which concerns itself with due regulation and domestic order of the kingdom whereby the individuals of the State, like members of a well-governed family, are bound to conform their general behavior to the rules of propriety, good neighborhood and good manners, and to be decent, industrious and not offensive in their stations."

While this definition has not been resorted to as describing the scope of police power, yet it has been approved with respect to regulation for the use and occupancy of buildings and to compel the making of certain improvements and maintaining sanitary conditions; and as to what extent such requirements are legal it has been held, "the legislature may direct certain improvements shall be made in existing houses at owner's expense so that the health and safety of the occupants and of the public at large through them may be guarded." The improvement or work must itself be reasonable, proper and a fair exaction when considered with reference to the object to be attained. The exaction must only be reasonable when compared with the amount of work of the character of the improvement demanded. "Within this reasonable restriction the power of the State may, by police regulations, so direct the use and enjoyment of the property of the citizen that it shall not prove pernicious to his neighbors or the public generally."

I take it further that the right to compel an owner to provide auxiliary fire apparatus or other equipment for the protection of the life of his employees or the public which may be endangered by neglect thereof (such as in case of fire escapes, stairways, aisles, etc.) stands on an equal footing with the acts of a legislature requiring houses to be connected with the public sewer; and the test to be applied to all such regulations is that "only such regulations as are palpably arbitrary can be set aside because of the requirements of due process of law under the Federal Constitution, and where they have a reasonable relation to the subject-matter it is not for the courts to say that they are beyond the exercise of the legitimate power of legislation."

As a final proposition I submit that such municipal regulations as reasonably prevent loss of property by fire, and where the cost thereby imposed is not disproportionate to the value of the property or the benefit to be derived; or where they are reasonably necessary to prevent loss of life, even though the cost appears oppressive; that such requirements are proper subjects for the exercise of the police power; and so long as the amount exacted is not unreasonable, considering the character of the work required, the property of the citizen is not taken in any constitutional sense. The promotion of thrift by the reduction of waste, and the observance of rules to prevent accidental fires, are two of the objects of government which pertain to the promotion of the general welfare.

Mr. Evans: As stated this morning, we must be measurably informal. This paper, although brought up under the relatively narrow first topic, relates to general *legal* considerations with respect to the control of the fire hazard. Will you make comments now or listen to the *physical* paper on the first topic first?

Mr. Guerin (New York City): I suggest that we comment on it now, as it is fresh in our minds.

Mr. Evans: Will you kindly begin the discussion?

Mr. Guerin: I find the total sum of the New York City Fire Prevention Bureau's work during the past two years amounts only to the local execution of it. This paper speaks to the common purpose of enforcing fire-prevention work, and I therefore commend its study to you. Your object can only be accomplished by the actual execution of the plans you devise.

Mr. Evans: We are very glad to have such an authoritative opinion. Any other comments?

Mr. Charles H. Cole (Boston): Did I understand Mr. McDowell to say that the police power did not include the power of limiting the height of buildings?

Mr. McDowell: That is the decision of the Supreme Court of the United States, but I believe the State of Massachusetts has decided otherwise.

Mr. Guerin: May I ask what was the cause assigned by the Supreme Court of the United States for refusing to limit the height of buildings?

Mr. McDowell: The reason was that any restriction of the height of buildings, unless necessary for public health or safety, is a public damage. They put it on the broad ground of its æsthetic value.

Mr. Guerin: But if it could be shown that the building was a menace to safety unless certain conditions were established within that building to offset or overcome the handicap of excessive height, would that not be an enforceable condition? In other words, could you not bring in the consideration that in case any building constituted an abuse by virtue of rising to such height as to render practically of no avail the assistance of the fire department for prompt relief in case of fire, such a building could be compelled to provide within its own four walls every element necessary for the people within that building to escape in safety?

MR. McDOWELL: Yes; but you must have the public health or safety threatened in order to make or enforce such a provision.

MR. GUERIN: But would not such conditions in fact afford proper legal reason to compel each building to have such a measure of protection within its own four walls that every person within that building would not need assistance from exterior sources in case of fire?

MR. McDOWELL: I would say that would be a self-executing law.

MR. GUERIN: We are working on that basis in New York City.

MR. GODDARD (Boston): I should like to ask Mr. McDowell if it is not a fact that it is a very common provision of building codes in many States that the height of a building shall not be more than a certain number of times the width of the street on which it is placed; and if it is not a further fact that such limit on the height of buildings is considered within the police power with no damages accruing; and, therefore, if it is not true that the case before the United States Supreme Court decided otherwise was a peculiar case rather than a common case, and that it does not really apply to limiting the height of buildings but to limiting the height of buildings for certain reasons—æsthetic reasons and not reasons of public health, morals or safety? We should not feel, I take it, that the Supreme Court decision had a bearing on all municipal ordinances limiting the height of buildings on account of fire, health, or moral danger that we have in our tenement districts, and, therefore, unduly limits what reasonable restrictions may be made. Was not the case above cited a unique case rather than a general decision?

MR. McDOWELL: I might answer by asking on what basis would you limit the building to be a certain proportion of the width of the street? What reason would you give the court?

MR. GODDARD: I was talking recently with a lady whose husband is interested in all social welfare. She said that in Paris a building cannot be higher than the width of the street, and she believed that any municipality that allows a building to be two and a half times the width of the street cuts off the light and sunshine and therefore the health of the occupants of the two or three lower stories; and therefore permits a very serious detriment to the public health.

MR. McDOWELL: I would say, if you could demonstrate to the Justices of the Supreme Court that the height of "skyscrapers" would be a detriment to health, they would agree about using the police power to limit such height. But, unless there is some data to show that the tenants in, say, the first five stories of a twenty-five-story building enjoy a different kind of health than the tenants in the last five stories, I am afraid they would not agree with us; and that if we look for regulation along that line we should prepare at once to collect data to satisfy the courts in order to adjust the question.

MR. CHARLES W. KILLAM (Boston): I would like to ask whether it is feasible for those making building laws to provide for the installation of automatic sprinklers generally.

MR. MCDOWELL: Such regulations are formulated, I believe, on the basis of unrestricted floor space. Whenever the unrestricted floor space exceeds a certain area you must have sprinklers; and in certain classes of buildings it is twenty thousand feet—I believe in Chicago it is something like twenty thousand feet—running down to the ordinary type of construction where it is limited to five thousand feet. Either you must have automatic sprinklers or else equivalent fire apparatus—it is an alternative of one or the other.

MR. KILLAM: I would like to ask, Mr. Chairman, if it is possible to require that in certain congested parts of the city there must be a certain zone system of sprinklers.

MR. MCDOWELL: I would say that would come under the question of making a fire district, as we call it; but I believe that in New York they have districts in which buildings cannot be built of combustible material at all. In this State, back in 1790, they established a fire-building limit, and the laws in Pennsylvania provide that it is within proper police power in cities to prevent conflagration.

MR. EVANS: Mr. Killam is asking from the viewpoint of the Boston Society of Architects. In this city and in St. Louis, I believe, there are requirements that certain areas of theaters and certain administrative areas of hotels shall be sprinkled. I think Mr. Guerin would have complete knowledge of what has been done in New York recently.

MR. GUERIN: The fire commissioner has held that in theaters, schools, lodging houses, and buildings of a like nature, sprinkler systems must be installed, under the head of "Fire Extinguishing Equipment;" and it went through their court—the Court of Police. Also, the New York Building Code requires the installation of standpipes in basements.

MR. A. L. BARSTOW (Rochester, N. Y.): I would like to ask the last speaker if the mercantile establishments were excluded from the case in the New York courts.

MR. GUERIN: The New York courts were more concerned about factories, and it was this class of buildings that constituted most of the cases coming before them; but it would appear that the jurisdiction of the courts covered all classes of establishments. I quote the case of Chrisman vs. The Fire Commissioner, about four years ago. The court held that where the condition was such that a large amount of inflammable material was exposed, and the possibility of fire was apparent, or fire had occurred, or might occur within reasonable probability, the fire commissioner could act.

NOTE.—*Re* "LEGAL AUTHORITY TO REQUIRE AUTOMATIC SPRINKLERS IN FACTORY BUILDINGS," NEW YORK CITY

The Appellate Division of the Supreme Court of the State of New York, First Department, February, 1914, term; in the case of Charles Kaye, Appellant vs. The People of the State of New York, respondent, rendered the following decision in an appeal from a judgment of the Court of Special Sessions of the City of New York, convicting defendant of a misdemeanor, viz:

> Where the owner of a factory building in the City of New York neglects or refuses to obey an order of the fire commissioner, issued pursuant to the provisions of section 775 of the Greater New York Charter, he is guilty of a misdemeanor under section 773 of the charter.
>
> Automatic sprinklers are included among the fire extinguishing appliances which owners may be required to provide in their manufactories under an ordinance of December 19, 1911.
>
> The discretionary power conferred upon the fire commissioner by the ordinance of December 19, 1911, respecting the installation of automatic sprinklers in factory buildings, was not abrogated by section 83b of the Labor Law, enacted by chapter 332, Laws of 1912, except in respect of buildings "over seven stories or over ninety feet in height, in which wooden floor or wooden trim is used and more than two hundred people are regularly employed above the seventh floor, or more than ninety feet above the ground level of such building."

MR. EVANS: We will now hear Mr. Ballinger's paper on the *physical phases* of this topic.

"PHYSICAL PHASES OF EXPOSURE HAZARD"

By Mr. Walter F. Ballinger, Engineer and Architect, Philadelphia, Pa.

In the following classification I am according with the Philadelphia building laws.

In preparing this paper I had in mind principally business and manufacturing buildings, because these are usually subject to the greatest fire hazard and because the principles laid down will be, very largely, applicable to other classes of buildings, such as schools, institutional buildings, or even dwellings. Theaters are largely in a class by themselves. I have endeavored to avoid the use of technical terms and details, merely mentioning the general principles involved.

The location is determined by the character of the business and its requirements with reference to the supply of material, transportation, distribution or sale of product. Retail businesses in cities must necessarily be most subject to exposure by neighboring buildings in order to be convenient to purchasers. This likewise applies to wholesale businesses, usually located in congested parts of cities. Manufacturing of certain kinds requires the plant to be close to the distributers, wholesale and retail; in which case they also must be in congested centers. Manufacturers of more staple products may be in isolated locations not subject to outside exposure hazard. Some of the factors which determine the location of a manufacturing plant, in addition to those mentioned, are:

- Convenience to operatives, to lines of transportation, to raw materials, to water supply.
- Sewage disposal.
- Cost of ground.
- Taxes.
- Police protection.
- Laws.

These requirements differ so much for various industries that it is difficult to formulate a set of rules that would apply to all cases. Other conditions being equal it is preferable to choose a location where the exposure hazard is small or entirely eliminated. Some of the hazards which should be avoided, if possible, are proximity to

- Lumber yards.
- Wood-working factories or shops, unless fireproofed and thoroughly protected.
- Stables.
- Frame buildings used for other than dwelling houses.
- Garages, unless of fireproof construction.
- Cleaning establishments, or other places where volatile oils or explosives are used.

Also hazards due to being in a neighborhood which is in or near congested centers, on account of conflagration. There is also danger from sparks from locomotives.

Some of the hazards from within are:

- Open stairs, or open elevators.
- Open light courts, or other shafts.

These form flues which permit fire and smoke to pass quickly from the lower to the upper stories of buildings.

- Poor construction: using wood joists and thin flooring, or unprotected steel work.
- Swinging gas jets.
- Defective wiring and heating.
- Bad housekeeping: allowing waste or rubbish to accumulate. (This, in addition to inviting fire from accidental causes, also gives opportunity for spontaneous combustion.)

Some of the more necessary safeguards for buildings for manufacturing and business purposes are:

- Walls and floors should be fire-resistant.
- There should be no openings of any kind through the floors where fire could pass from one floor to another.
- Where openings are necessary they should be protected by fire doors, preferably automatic closing.
- Stairs should be enclosed in brick or concrete walls with fire doors (preferably automatic closing) leading to the several floors.
- All freight elevators should likewise be enclosed in brick or concrete walls and have automatic closing doors.

Passenger elevators should likewise be so enclosed unless enclosed in stair wells which are properly protected.

Interior light courts in buildings should be avoided, if possible. Where absolutely necessary they should be protected by automatic windows of wireglass with substantial metal frames. The metal frames may be either hollow sheet metal type, or they may be of the newer sections of rolled steel. These, if properly supported by fireproof mullions, should resist fire as long as the wireglass will last.

Certain kinds of trimmings put on walls of otherwise fire-resistant buildings would be so damaged by fire that possibly the whole wall would have to come down.

Similar protection should be provided on all exterior windows facing any exposure hazard. Metal rolling shutters, held open by fusible links, also provide a fair measure of protection to exposed window openings.

Fires in fire-resistant buildings have been known to break through windows in either of the types of metal frames above mentioned will fire successfully to the contents of each of the upper stories. Wireglass windows in either of the types of metal frames above mentiond will prevent this. In existing buildings of the older type that do not have wireglass windows and metal frames a measure of protection may be obtained by using fire shutters made of wood covered with tin, with proper hardware. These form a better protection, when closed, than wireglass; but there is danger that the shutters may not be closed when a fire on the outside occurs, and there is no time to close them (if not already closed) if a fire occurs within.

There is so little difference now between the cost of fire-resistant construction and combustible construction that, all things considered, the former is usually found to be more economical. Some of these considerations are:

Lower insurance rates on building and contents.

Less depreciation in value—depreciation being due to two causes: first, natural wear and tear; second, obsolescence.

A thoroughly up-to-date building does not become obsolete so readily as one less carefully designed.

It is possible to get a greater amount of daylight in a fire-resistive building than in a building of second or third class construction. Lumber is continually getting more expensive, whereas fire-resistant construction, due to improvements in the art, is less expensive than formerly.

Walls should be designed so as to resist fire, and the necessary trimmings should be of such a nature and so placed that they could be renewed, if damaged, without demolishing and rebuilding the walls.

In non-fire-resistant buildings division or fire walls should be parapeted at least three feet above the roof. This is not necessary in fire-resistant buildings.

Interior fire walls should be provided between processes of unequal fire hazard, as well as the area limited by the introduction of fire walls to what is known to be good practice. Our Philadelphia building law we consider as good practice in this regard. It allows five thousand square feet of area in a third-class building, which has brick walls and joist or unprotected steel in its construction. Fifteen thousand square feet undivided area is allowed for second-class construction which has brick walls and plank and timber floor construction, avoiding the use of joist; and for first-class, or fire-resistant construction, twenty-five thousand square feet area is allowed. Concealed spaces should be avoided.

Walls should be either sufficiently thick to be self-supporting or be braced by fire-resistant floors. Party walls or walls close to party lines should be solid, that is, without openings where overlooking roofs of other buildings, unless the roofs are of fire-resistant construction.

Parapets on all exterior walls are desirable even where a building is fire-resistant, as they form screens for firemen to fight fires in nearby structures.

Remarks herein apply particularly to new structures. The question of remedying existing structures presents more obstacles, both physical and legal. All buildings in congested areas of cities should be of fire-resistant construction and sprinklered.

Where skylights are necessary they should be provided with protecting wire screens.

Probably the best safeguard against fire gaining headway is the automatic sprinkler. A building properly equipped with automatic sprinklers and having an ample water supply from at least two sources, with sufficient pressure, is regarded as a fairly safe risk; in fact, the contents of a non-fire-resistant building, sprinklered, are usually regarded as a better risk than those of a fire-resistant building not sprinklered. A fire-resistant building with inflammable contents cannot be expected to be any better than a stove; that is, to remain uninjured while the contents are consumed, unless means of extinguishing the fire are provided, but it can be so arranged as to confine the fire in the room in which it originates.

An open sprinkler system over the windows of a building is a good protection from exposure without, as by this means a water curtain can be placed between the building and the neighboring fire. This has proved effective in saving many buildings from fire damage from outside exposure.

I have had occasion to differ with some fire-prevention engineers on the subject of window openings, as some of them advise limiting the areas of windows in any wall—some to less than 50% and some to less than 40% of the area. Of course, we would all agree that a wall without any windows protects against fire better than one with windows, and it follows that the greater the glass surface the greater the danger from fire from without; but architects do not design buildings nor owners pay for them with the sole object of keeping out fire. We must admit the daylight, sunshine and air, and by means of our modern construction we are able to get light to the interiors of wide or deep buildings by making the wall piers narrow, the lintels flush with the under side of the floor slab, all intervening space between piers, sills and lintels as small as possible; and, by means of rolled steel sash, bar as little light as possible by construction.

It is found that the efficiency of a manufacturing plant or store is increased by a large amount of daylight and air, and it is easy to close the windows to prevent the entrance of the air when too severe, and likewise to draw the curtains to shut out the sunshine when too warm or too strong, but if we do not have the window area we cannot make the sunshine or air when we want it.

At the N. F. P. A. Convention, held last May in New York, the Committee on Fire-resistant Construction read an excellent report on a suggested model building, in which report it suggested limiting the area of the openings, and also that the lintels be at least twelve inches below the ceiling. Upon my inquiring the fire-prevention reason for this a member of the committee stated that if, in a sprinklered building, the window extends to the ceiling and is left open and a fire occurs near the window, the cooling effect of the air on the sprinkler would delay, for a time, the operation of the sprinkler; whereas, if the hot air could be kept at the ceiling until the sprinkler should operate it would be more effective. This I recognized as a good reason, but I still contend that it is frequently desirable to have the windows as near the ceiling as possible as one foot of light at the ceiling is more effective than three feet just above the window sill for lighting the interior of a building over the tops of machinery and piles of stock. We continue to design our buildings with the lintels turned up instead of down, but provide one row of stationary wireglass windows below the lintel, having the window frames of metal, glazed with wireglass. Ventilating panels are kept one light of glass, or about twenty inches, below the ceiling, which accomplishes the same purpose, and if more space is required between the lintel and the sill next above, it is preferable to raise the window sill rather than to lower the lintel.

In congested districts the roofs should always be of fire-resistant construction, but in a building sufficiently wide to require interior columns it is impractical to build a fire-resistant roof unless the floors under it are likewise of fire-resistant construction. If the roof itself is not of fire-resistant construction at least the roof covering should be non-combustible.

Cost is a factor in all buildings, and where fire-resistant construction may seem to be impractical because of the increased cost, it is all the more necessary to take the utmost precautions regarding the protection of roofs, windows, skylights, floor openings, etc., to prevent the entrance of fire from without or its ready passage from one floor to another.

Encouragement should be given, both by building codes and insurance rates, in cases where absolutely the best construction is prohibited by the cost, to the substitution of the cheaper forms of non-combustible or fire-resistive construction in place of wood, even though the protection thereby afforded may not be so positive as if the best known materials and methods were used. For instance, cement blocks or hollow tile for partitions are preferable to wood-studded partitions and likewise are preferable for exterior walls of the lighter class of buildings where frame might otherwise be used. Slate or asbestos shingles are superior to wood shingles. In fact, wood shingles form a great fire hazard.

In conclusion, I would say that if the exposure hazard were protected so as to confine fire to the building in which it originates the fire waste throughout the country would be greatly reduced.

MR. EVANS: Before we pass to remarks on this paper I should like to read a letter from Mr. W. C. Robinson, Chief Engineer of the Underwriters' Laboratory, Inc., of Chicago.

MR. POWELL EVANS, *Chairman,* Oct. 9-1913.
Philadelphia Fire Prevention Commission, Philadelphia, Pa.

DEAR SIR:

On my return from my vacation I find your communication of Sept. 3d and subsequent circulars in relation to the convention to be held in Philadelphia next week. This matter reaches me entirely too late to give the necessary thought to the paper allotted to me on the question of exposure hazard, and I also regret that pressure of matters here will make it impossible to attend the convention.

Mr. Merrill, as you know, expects to be present at the meeting and with the work in its present condition here it does not seem advisable for both of us to be absent at the same time.

The subject of exposure hazard, as you have indicated in your suggested treatment, is a broad one, and I have no doubt that a thorough discussion of the points as you have listed them will probably bring out a great deal of value along lines pertinent to the resolution.

It is needless to say that I regret very much the fact that things have so shaped themselves that I will be unable to attend the convention.

Very truly yours,
UNDERWRITERS' LABORATORIES, INC.,
W. C. Robinson,
Chief Engineer.

The effort was to get a joint view in a paper of this character—a construction engineer at one end and an insurance engineer at the other. The meeting is now open for remarks.

MR. G. M. ROBERTSON (San Francisco): Mr. Chairman, I have listened with great interest to Mr. Ballinger's paper and consider it of great value. I was also extremely glad to hear Mr. Killam of Boston, because, gentlemen, architects don't take the question of construction very much into account, according to my experience, and it is a very wholesome sign of the times that they should begin to do so. Too much cannot be said in regard to the construction of buildings so that a fire within them cannot come out, or a fire from without get in. I have seen many fires that have gotten away from the fire department, and am impressed thoroughly with that idea.

The fire in San Francisco was one of that description—uncontrollable because a large main bringing water into the city was broken and there was no water, and no pipe except along the wharf from the fire boats, for which there were not enough. It was only by means of large bombs, and finally of dynamite, that at last under General Funston the fire was controlled. But the necessity for fire-resistant construction was clearly shown by the way the fire spread laterally from one building to another —with nothing to prevent it. Had the building construction been such as commended here this would have been impossible.

Take, in illustration, the Telephone and Telegraph Building in San Francisco, a new building of refractory construction—concrete construction, and everything closed except one door in a yard at one end of the building. It was full of packing material. The company had just moved in and the stuff in it was unpacked, and the fire came in from one door in the back yard of that building and burned everything in it, all the shutters being closed. Another building also, an electrical concern, full of combustible substances, had wireglass and concrete construction, and they saved everything in it, because the fire could not get in.

There are two methods: one, that of applying the fire-fighting apparatus inside; and the other that of material prevention, by means of fire-doors and shutters, to keep it out. To my mind the better method is that of material prevention—fire-resistant walls and floors and some shutters of fire-resistant construction. It is impossible, to my mind, to pass an ordinance and compel its observance except in large cities. In small cities it is very likely to be set aside when occasion offers, because they like somebody and would hate to put him to the expense, or for one reason or another. Therefore it seems necessary to bring into existence the "zone" system in that kind of locality and to prevent extra-hazardous kinds of business. But this, I presume, is under another subject.

MR. EVANS: It follows this subject immediately.

MR. H. W. TROTH (Camden, N. J.): In speaking of the tinned shutter being better fire protection than wireglass, is it not likely that the tinned shutter alone would give as ample protection as wireglass, if anything wrong with that be discovered?

MR. BALLINGER: The wireglass, I believe, is better protection because it is more easily closed in case of fire. I did not take up the subject of dry-rotting wood. Care must be taken to get the right wood in a tin-covered shutter, otherwise the wood, rotting, would not have any properties to resist fire; for, while tin prevents the fire getting at the wood, the wood does the resisting.

MR. C. B. WHYLER (Cleveland): Speaking as a fireman, I have seen buildings on fire which were entirely closed by iron shutters; and firemen have a hard time getting into such a building. One building in particular, I remember, burned down before we were able to get the shutters off and get into the building.

I think wireglass and metal frames better than the iron shutters.

Mr. Edwin Clark (Philadelphia): I would like to ask Mr. Ballinger if he does not think it desirable to limit the area of windows in the building? Has any test been made to demonstrate that wireglass and metal frames are more efficient when in a smaller frame?

Mr. Ballinger: I don't know what test has been made, but I know that certain of the underwriting companies limit the size of the window to 5′ x 9′, with fire-resistant mullions and imposts. While that may be an arbitrary size, I think the provision a wise one. I don't think the ordinary rolled steel sash safe, for instance, on the frames such as we make them—10′ x 11′ or 12′ x 14′—without any fire protecting mullions that would offer resistance in case of fire. I think that window frame or sash might buckle or fall before the glass. I think it is good enough, however, where there is no exposure except its own, to prevent fire from carrying from one floor to another. There are degrees of fire resistance which I think should be applied according to the degree of the hazard; and where the windows are not over 5′ wide by 9′ high, I would suggest that they need the whole opening, but limit the unsupported area of the sash or window frame to that, so that if you want to have a window 15′ wide (practically three windows), have intervening fireproof mullions; and I don't believe in limiting the areas of windows. I think we need to have large window areas if we have large buildings. We have buildings now 100′ or 200′ wide—I was in one the other day 400′ long and 200′ wide. They should get light into the interior of those buildings, and cannot do it with the old-style, small-sized windows. I think we get a reasonable protection and much light by the method I suggested.

Mr. Clark: I would like to call your attention to one point in these wireglass, metal-framed buildings. Aren't they designed in such a way as to make it difficult for occupants to get out of the buildings? And should not some regulation be made to cover that?

Mr. Ballinger: You are right as to a great many of them. If it is a pivoted sash in small sections, it would not make it easy for people to get out. In a building we recently designed in New York the owners brought up that very point, and to overcome it we made the metal ventilating panel in each set of windows the size of two lights of glass. That would allow persons to get out easily at any part of the buildings. I don't think that the rolled steel sash necessarily needs to be pivoted. However, I say "pivoted and balanced tight" where the upper sash hangs on the same chain as the lower sash. This applies also to the double pulley, which is much more expensive, and in many cases its cost prohibits its use.

MR. GUERIN: I would like to recite an experience I had on that point. We have four distinct types of self-closing wireglass windows that are used to protect from exterior fire exposure. You can lift the window and walk out, or if the fire releases the releasing device you can still open the window and walk out.

MR. E. P. STOVER (New Haven, Conn.): In considering the use of wireglass for insurance protection we should not lose sight of the fact that where fire is severe heat could radiate through the glass and get into the inside of the building.

MR. BALLINGER: I think I mentioned the open sprinkler. Where the risk is great I should put in both.

MR. STOVER: I think the water supply has not always been properly considered. Where the open sprinklers are supplied from the city water mains the steamers will create an excessive draught on the main and there is a good possibility that you won't get water through the open sprinkler.

MR. COLE: I might mention an experience we had in Boston. I got the opinion of fifteen different battalion chiefs comparing wireglass windows with shutters. Practically all the chiefs believed in the wireglass window. The shutters, they believed, were good for outside exposure but for inside the building they were more detriment to the fire department than if not there. One style of shutter, on only two buildings in Boston, can be operated from the ground—you can open the shutters in any line of windows above. That shutter, the battalion chiefs agreed, was all right.

MR. LLOYD MIDDLETON (Memphis, Tennessee): My personal experience in fires leads me to think that the fire shutter is perhaps a better retardant than the wireglass window. It has been the practice in our field not to permit shutters on openings where the number is limited. If there are twenty or thirty or more window openings it is usually the distinct work of some particular man to close these shutters. In connection with the wireglass windows they are highly effective fire-stops; and then the fire bureau having jurisdiction can arrange for a small fence or guards in back of the windows to prevent stock from catching fire by radiation.

MR. GORHAM DANA (Boston): Before leaving the topic I would like to bring up the question of cement blocks. I notice that Mr. Ballinger recommended cement blocks as not the best type of construction but superior to many types. I think there are a great many well-versed insurance officials who have little faith in cement blocks. In fact, some have said they are not so good as wooden construction. While I would not go so far as that, I would say that cement blocks vary greatly, and the poorer makes are very poor building material, while better ones are a good building material very often. It would be well to qualify that and state they do vary greatly in quality.

MR. BALLINGER: I fully agree with what Mr. Dana says. The same might be said of hollow tile, but I do think it would be an advance if we could bring about the use of cement blocks or hollow tile for exterior walls of cheaper dwelling houses in places where otherwise they might build of frame. I think it an advance in fire protection to encourage their use. While not as resistive as concrete or solid brick, they are greatly superior to wooden construction.

MR. CLARK: I would say that in our Philadelphia city testing laboratory we have tested concrete blocks, and if properly cured they are good fire-resisting construction.

MR. EVANS: Is there any other discussion? (Pauses.) If not we are now ready for your judgment as to the tentative resolution that was suggested with respect to this topic. Do you sustain it or wish to modify it, or what is your pleasure? I will read the resolution again.

Mr. Clark moved that the resolution be adopted as read. Motion seconded by Fire Marshal Parkman, of Kansas; and unanimously carried.

Resolution Adopted on Topic 1

"It is the sense of this Convention that:

> Fire is always local, originating from a definite cause in a definite property on a definite location; hence every building—in reasonable relation to its size, character, use and the congestion of its location—should be so constructed as to prevent the passage of fire from within to without and vice-versa."

Topic 2—"Zones of Danger"

NOTE.—The *aggregate unit* fire exposure becomes *Communal* fire exposure—hence the consideration next in order of *groups* of unit exposures.

MR. EVANS: The next topic is No. 2—"Zones of Danger," under the tentative resolution announced. Before we proceed to this may I interject the remark that, in so far as the Fire Prevention Commission and the speaker are concerned, we have nothing but the deepest thanks and highest praise to extend to all those who have helped us with these papers. As I am trying to be of use here in running this Convention as speedily as possible, I rather dodge going through the formal expression of thanks as each paper is read; but I believe the applause after each paper is more than a perfunctory vote of thanks, and unless a motion is made we will consider that the preparer of the paper is deeply thanked in each case.

This topic has been considered from two viewpoints. The purpose in first asking the preparers of papers was to get a joint view, but the limits of time have made it impossible to go through that amount of correspondence. So we have taken what has been brought to us and I believe it is measurably better than if we had followed out the original plan.

I have a communication from Mr. Edgar A. Weimer, architect and President Pennsylvania State Building Code Commission, about the legality of establishing fire limits. Therefore it is very pertinent to discuss a subject concerning which we have legal authority to carry proposals into effect.

NOTE.—*Re* "LEGALITY OF FIRE LIMITS, STATE OF PENNSYLVANIA"

DEAR SIR: OCTOBER 6, 1913

I have your letter of October 3d, in which you ask me to refer you to the Pennsylvania decision holding that the establishment of fire limits was unconstitutional. I cannot immediately refer you to that decision, but if I have time in the next few days I will look it up for you. The force and effect of such a decision, however, has been overruled by a recent decision of the United States Supreme Court holding that the establishment of fire limits was constitutional. We shall govern ourselves, of course, by this later decision.

Very truly yours,

EDGAR A. WEIMER
President

NOTE.—"LEGALITY OF FIRE LIMITS, STATE OF NORTH CAROLINA"

The decision of the Supreme Court of North Carolina, Fall term, 1913, in *State vs. Lawing,* clearly established the law to the effect that the *building and inspection laws of the State,* and *like ordinances of cities and towns, must be obeyed.*

MR. EVANS: Mr. Clark will now address you first on this topic:

"ZONES OF DANGER"—1

By Mr. Edwin Clark, Chief of the Bureau of Building Inspection, Department of Public Safety, Philadelphia

The topic "Zones of Danger" is one that concerns all cities everywhere. All property destroyed by fire is irreparably lost to the world, and every means should be employed that will tend to reduce this loss. A man may lose his property, but this is but another man's gain; but the loss by fire is complete; much more so than by any of the other elements. Wind may wreck a building and, if unaccompanied by fire, there is still some salvage. An earthquake may cause the collapse of a structure, and if fire is not present something still remains. Floods may occur, yet the property loss is not complete; but fire eliminates everything.

The question of the equable right of the community to protect itself from a catastrophe such as a conflagration, as exemplified in the Baltimore fire, is self-evident, and the individual gain sought in the attempt to defeat this right should undoubtedly be nullified by incorporating in the constitution of the State such equable rights. A building code requiring certain classes of buildings to be erected of fireproof construction does not solve the problem as far as it relates to zones of danger, as many classes of buildings are grouped together in a zone, some of which may be required to be fire-resistant buildings and some not fire-resistant, thus giving rise to exposure hazard. Requiring certain classes of buildings to be fire-resistant does protect the occupants of such buildings to a certain degree.

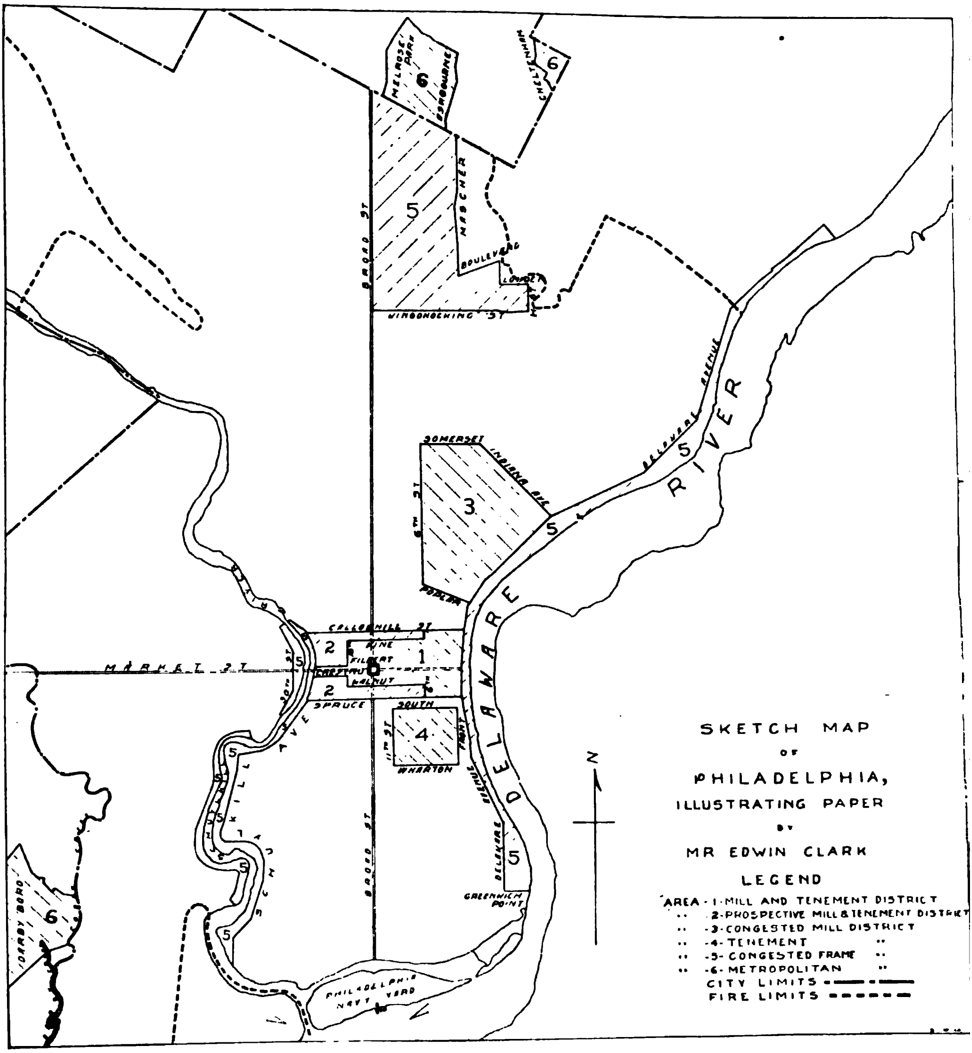
It is necessary that a uniform class of construction be followed in a zone to produce a uniform exposure hazard. Zones of danger are created by congestion, thus increasing the valuation per acre and population per acre. There are four conditions that may exist:

1. Large valuation in conjunction with large population per acre, as found in the business section of a city;
2. Large valuation with small population per acre, as shown in the fine residential section;
3. Small valuation with large population per acre, as illustrated in the mill and tenement districts;
4. Small valuation coupled with small population per acre, as found in the outlying suburban sections.

Two of these conditions are of vital interest to the public, viz: large valuation with large population, and small valution with large population.

The business section of a city is usually the congested area. Here the valuation and population reach a maximum. This section constitutes a zone of maximum danger, as the property loss would be the greatest in case of a conflagration. In this section due consideration should be given to the class of buildings as far as it relates to construction; narrowness of streets; adequate water supply; the protection of windows and openings; battlement walls; and private protection in general. Hazardous industrial pursuits should be eliminated. Explosives containing denitro benzole, the chief compounds being roburite, dynamite, nitro-glycerine, tonite, melinite and gunpowder, should be located in isolated territory and not be manufactured or stored in large quantities in the city limits.

The manufacture of celluloid, the manufacture and storage of large quantities of moving picture films, and the storage of acetylene gas above a certain quantity, the distillation and storage of large quantities of gasoline, benzine and kindred volatile oils and spirits, should all be confined to the suburban district with a low population per acre and with a specified minimum distance from property lines. In addition, due consideration should be given to the construction of the building and to private protection. Volatile oils and spirits should preferably be stored in underground reservoirs or tanks.



In zones of danger certain and definite safeguards should be thrown around certain occupations, such as the use of the glue-pot and the ironing-board, and certain forms of construction, such as the carry-off pipes from ranges in hotels and other buildings, and the setting of boilers and ranges.

The garage should receive careful consideration as regards its construction and the amount of gasoline and manner of storing.

In zones of danger with small valuation and large population, as illustrated in the mill and tenement section, a definite form of construction with adequate private protection should be required. In the tenement section the overcrowding of buildings and the lack of the necessary appreciation of the danger from fire necessitates the introduction of private protection and careful periodical inspection. As an illustration, on the map of Philadelphia as prepared, the congested area is shown as a belt of varying width, *number one,* extending from the Delaware to the Schuylkill River and embracing all that section lying between Callowhill and Spruce streets east of Sixth street, and between Vine and Walnut streets between Sixth and Eighteenth streets, and between Filbert and Chestnut streets west of Eighteenth street. This section has a population averaging 290 per acre, who live and work in the district, not including visitors, and a valuation averaging $391,803 per acre.

The area shown, *number two* on the map, indicates the *prospective* congested area. It includes the territory lying south of Callowhill street and north of Vine street between Sixth and Eighteenth streets, and north of Filbert street west of Eighteenth street, and that section lying between Walnut and Spruce streets between Sixth and Eighteenth streets and between Chestnut and Spruce streets west of Eighteenth street.

Considering the valuation and population per acre in the above two areas it would be advisable to prohibit the erection of other than fire-resistant buildings irrespective of their height or size, such buildings to have proper window-opening protection and private fire protection in the form of sprinkler systems, standpipes, fire extinguishers and automatic fire alarms, together with efficient public service with ample water supply and an efficient fire department. In these areas all specially hazardous pursuits should be eliminated. The creation of this fire-resistant belt would divide the city between the Delaware and Schuylkill rivers into two sections and prevent a great conflagration, which might start in either section, from crossing this belt into the other section.

The area shown, *number three,* represents a low valuation with a large population per acre, the average valuation being $48,843 and a population of 93 per acre. This is the congested mill district. All buildings erected in this territory should either be fire-resistant, or of mill construction with adequate private fire protection. All window openings in this section should be protected with wireglass and metal frames.

The tenement area shown, *number four,* has an average valuation of $68,817 per acre, with a population of 206 per acre. It will be noticed that this is a very large population, and in order to safeguard life and protect property it is desirable that all buildings constructed in this section be of fire-resistant material. Private fire protection should also be required.

The section shown, *number five* on the map, represents the congested frame district with a low valuation, averaging $5783 per acre, and a population of but 10 per acre. Bordering on the fronts of the Schuylkill and Delaware rivers is a narrow—5, 5, 5,—strip showing the erection of frame buildings on the water fronts of these two rivers. These are danger zones and this character of building should be prohibited.

The relative cost of a building with brick walls, as compared with one of frame, does not amount to more than fifteen per cent. in the total cost of a building, and a step will be taken in the right direction if the fire limits are extended to the city limits. Oak Lane, which is in the Forty-second Ward, is at the present time a frame district and abounds with frame buildings. This should be incorporated in the fire limits and frame buildings prohibited.

The *fire limits* are shown by dashes, and represent the area within which the erection of frame buildings is prohibited, with the exception of the narrow strip bordering on the fronts of the two rivers as shown 5, 5, 5.

The *city limits* are indicated by alternate long dashes and short dashes.

The *metropolitan* area, as shown upon the plans, is shown—6, 6, 6,—. It is purely a suburban section and does not in any way affect Philadelphia from a conflagration standpoint. In many cities, however, the metropolitan area is of vital importance; and where such metropolitan area is not included within the corporate limits, State laws should be drawn governing the erection of buildings therein uniform with the laws regulating the erection of buildings within the city limits. Each city presents a different problem and undoubtedly requires a different solution, and it is a question whether it is feasible in all cases to determine the character of construction and the kind of protection to be provided on the basis of valuation and population per acre. But where land valuations are great it is undoubtedly true that larger buildings must be erected in order to provide proper returns upon the cost of the investment and the increased taxes due to such land valuation. Such increase in the size of buildings must of necessity produce a corresponding increase in the population in such section; and in connection with this matter I would suggest the possibility of a legislative enactment which would require that all areas, after they reach a valuation of $250,000 per acre and a population of 200 per acre, be designated as fire-resistant areas, and that all buildings thereafter erected therein must be of fire-resistant construction with adequate private and public means for protection against fire.

Mr. Evans: Most of these problems, when we get down to real work, have to be studied on the spot with respect to their definite facts; and by multiplying carefully studies of the local problem in each case we begin to build up a curve, so to speak, which is a definition of a sound course of country-wide action. A most remarkable series of studies involving these problems has been made in recent years by the National Board of Fire Underwriters. They used much money, experience and work, and their findings have been of untold value and benefit to this country. Mr. Clark's paper is a study of local conditions here and is very helpful to this city.

The next paper on this subject has been prepared by Messrs. Charles H. Cole, Fire Commissioner, and Mr. Francis R. Bangs, of the Boston Metropolitan Fire Hazard Commission, both of Boston, and will be read by the former.

MR. COLE: Before I read our paper I want to express my appreciation to the Philadelphia Fire Prevention Commission and its Chairman for the great work they have done in bringing together so many representatives from different parts of the country. I think few of the public realize the gravity of the economic question of fire waste; and it is no wonder, in view of this great fire loss, that active, energetic and aggressive men have been hammering at this question for many years, almost unaided. And now I believe we are about to see the public awaken from its lethargy. Mr. Clark and I had in mind the same proposition as to "Danger Zones." I tried to figure it out on his basis of population and value per area. But in Boston and New York in the most valuable area there is almost no population; and in Boston particularly, in outlying districts where there is almost no value, there is a tremendous population. So Mr. Bangs and I abandoned that method and suggested another in this paper. This is primarily for discussion for the purpose of bringing out the various views.

"ZONES OF DANGER"—2

By Messrs. Chas. H. Cole and Francis R. Bangs, of Boston

Since the Civil War our losses from fire have been seven billions of dollars, the cost of our fire departments has been five billions, and the loss caused by the interruption to business two billions—a total tribute to the Fire Fiend of fourteen billions of dollars in less than fifty years. This is a sum nearly equal to twice the real estate value of the great city of New York, fourteen times as large as our national debt, and thirty-five times as great as the cost to all the allied nations in the recent Balkan wars. Therefore, it is not surprising that a few earnest and energetic men have been hammering away at this question until it now appears that the public is finally to be aroused from its lethargy. My small part in this Convention was to prepare, in collaboration with Mr. Francis R. Bangs of Boston, a lawyer, a real estate trustee and expert, and a member of the Metropolitan Fire Hazard Commission of Massachusetts, a paper on the subject: "Populous communities should be divided into danger zones, whereby rules as to the *presence, form* and *use* of property may be imposed in degrees and within limits proportioned to the congestion of life and property in any unit area, present and prospective."

In all municipalities of any size the actual danger from fire is greater in some sections than in others, depending on various differences in the existing conditions, but chiefly upon the congestion of buildings and the character of their use or occupancy.

Unless the utmost care is taken to mitigate the danger by means of good laws relating to material, construction and occupancy of buildings, congested districts are extremely hazardous from the standpoint of danger from fire. The hazard may be the possibility of a serious property loss in a few large buildings, or it may be the possibility of a conflagration and the loss of many buildings.

A dangerously congested area may belong to any one of the following classes:

1. Large and highly valuable office buildings.
2. Wholesale mercantile buildings with their valuable contents.
3. Large retail stores with their hundreds of employees and thousands of customers gathered under one roof, usually with insufficient means of egress in case of fire.
4. Loft buildings where manufacturing is carried on with numerous employees.
5. Dwelling houses converted into factories—in their new use far more dangerous from fire than their original construction contemplated—and housing many more people than the architect counted on.
6. Business hazardous in its nature, such as lumber yards and coal pockets, which are usually found on the waterfront; grain elevators, manufacturers of explosives, railroad yards, oil refineries, garages, etc.
7. Tenement or apartment houses where many families dwell under one roof.
8. Finally, the congestion of wooden construction in outlying districts.

It has become general in the larger municipalities to set apart districts within which special precautions against fire are taken, usually by laying down certain requirements for the erection of new buildings, the alteration of old buildings, limiting the height of buildings, prescribing the material and methods of construction, and under certain conditions requiring the installation of sprinklers, standpipes, or other fire-extinguishing apparatus; and also in some cases limiting the use to which buildings of the more inflammable nature can be put within such district.

Conditions vary, of course, with different cities. The prescribed district is commonly called the fire limits, and divides the city into two zones, in one of which is allowed buildings only with brick, stone or other incombustible walls, but where wood can be used in the interior; the other where frame construction may be used.

We believe that the delimitation of such districts usually follows arbitrary lines, and that the whole question of danger zones or of specially dangerous areas has seldom received scientific treatment—in many cases has worked hardships on property owners, and has brought certain sections within the fire limits that really do not belong there. It seems to us that the plan we suggest in this paper allows a more natural classification and that the divisions which it would make follow along the lines of business development, or just a little ahead of it. This method would prevent what is often seen in our larger cities—cases where temporary wooden or second-class buildings are put up beside valuable fireproof buildings after the erection of the latter. At least a year should be allowed for the protection of real estate interests before this division which we suggest goes into effect. While we feel that there would be very little disturbance under such a plan, this would allow time enough for the readjustment of such real estate values as might be disturbed.

First of all, every city should have a modern and a model building code which should prescribe the material, construction, structural strength, etc., of all future buildings in the city. This code would, of course, be subject in each city to peculiar local variations, but certain regulations should be in force in all cities and should apply to the whole city. It should contain the following provisions:

1. Limiting the height of buildings to 125 feet as a maximum.

2. Prescribing that all theaters, motion picture houses, public buildings, light and power plants, refrigeration plants, oil refineries, garages, buildings over five stories in height, and all buildings used for tenement or apartment houses over four stories in height should be of fireproof construction.

3. No wooden buildings should be erected except for dwelling purposes.

4. No building should be erected within 12 feet of any other building, unless separated therefrom by fire walls of brick, masonry, etc., with all openings in such walls protected by wireglass in metal sashes and frames.

5. No roofs should be built except of incombustible material.

6. In all dwellings housing more than one family all construction below the first floor should be fire-resistant.

7. In all dwellings housing more than three families there should be no connection between the first floor and basement.

8. The building code of the city should provide for three classes of construction:

First class—that in which the use of so-called fireproof material is required throughout.

Second class—that in which outer walls of brick, masonry, concrete, steel, or other incombustible materials are required.

Third class—frame and all other construction inferior to second class.

The city should be divided into four divisions, the first, second and third class, and a special division or district.

The first-class division should include all blocks in the city in which the land is covered with buildings to the extent of 90 per cent. of the superficial area excluding streets and passageways, and where the buildings on such 90 per cent. of covered land shall average at least five stories above the basement. This division would in all probability include the large office buildings, the wholesale mercantile buildings, the larger retail stores, and many factories and converted factories.

In this division all future buildings and alterations of more than 10 per cent. of a building should be of first-class construction, with floor areas limited to the following:

Buildings fronting on one street to have not over 7000 square feet between fire walls; fronting on two streets, not over 8000 square feet, and fronting on three or more streets, not over 10,000 square feet. These floor areas may be increased 50 per cent. when the building is equipped with automatic sprinklers. All buildings to have smokeproof and fireproof stairways and elevator wells, with such sprinkler, standpipe or other fire extinguishing systems, and with such fire shutters and wireglass windows as may be required by the fire department.

Any district in the city in which blocks belonging to this division predominate should be protected from fire by a duplex high-pressure system entirely separate from the sprinkler system used in the buildings and the domestic water supply system. The hydrants of this system should be not over three hundred feet apart. The personnel and number of companies of the fire department should be 80 per cent. stronger in such districts than in districts where blocks of the third-class division predominate. No water mains should be less than ten inches in diameter. The high-pressure system, in our opinion, is the most effective method known to-day of fighting fire.

No building should be more than four hundred feet from a fire alarm box.

The second-class division should include all blocks in the city in which the land is built upon to the extent of between 30 and 90 per cent. of the superficial area, excluding streets and passageways, and where the buildings on such covered land average in height three or more stories. In this division would be found the smaller factories, office buildings and retail stores, the tenement or apartment houses, and city dwellings. In this division all future buildings and all alterations of existing buildings, amounting to more than 10 per cent. of an existing building, should be of second-class construction or better, with floor areas limited to 4000 square feet of floor space between fire walls, if building fronts on one street; 6000 square feet if it fronts on two streets; 8000 square feet if it fronts on three or more streets, with 50 per cent. increase added for installation of automatic sprinklers.

The fire department should have authority to require in this division the installation of sprinklers, standpipes or other fire extinguishing systems, and shutters and wireglass windows in such factories and retail stores as it deems necessary.

Any district in the city within which blocks belonging to this division predominate should have the personnel of its fire department 100 per cent. stronger than that required in the districts in which blocks belonging to the third-class division predominate. No building should be more than 500 feet from a fire-alarm box. All fire engines should be equivalent to a first-size steam fire engine. No water main should be less than 8 inches in diameter, and fire hydrants should be not over 300 feet apart.

The remainder of the city not included in divisions one and two should be subject to no restrictions in the matter of the material used in construction, but it should be provided that no wooden building should be over 45 feet or over three stories in height above the basement, nor built nor altered to have more than 2000 square feet of floor area, nor to be used for any but dwelling purposes.

In districts of the city in which blocks of this class predominate there should be one fireman for every 1500 of population; one fire engine for every 20,000 of population; one ladder truck for every 25,000 of population. No building should stand more than 500 feet from a fire-alarm box. No water main should be less than 8 inches in diameter, and no building should be more than 300 feet from a hydrant.

A district of the city should be set apart by the public authorities in which should be situated: first, lumber yards, which should be separated from any other buildings by a clear space of 150 feet, or sufficient fire walls; second, all buildings in which business of a hazardous nature is carried on. It should be required that these buildings be constructed of prescribed fire-resistant materials and situated a certain distance from other buildings, or else separated from them by fire walls. All buildings in this district should be subject to regulations prescribed by the fire department, which would be based on the relative hazard of the business.

This plan, we believe, can be worked out in any city as at present built. Taking each block by itself we think that most of the blocks in the more valuable congested districts would be first-class buildings already, and that where there is at present too much congestion of wooden construction the blocks would be already in the second division, so future frame construction would be prohibited. This plan would work automatically, for just as soon as the land in any block became valuable and large and expensive modern buildings were erected upon it, it would bring that block into the first-class division. In the same way, whenever wooden construction increased in any block, so as to be dangerous from a fire standpoint, that block would automatically come into the second-class division.

The above proposal contemplates only the larger cities—of 200,000 or 300,000 population—and it assumes that each of such cities is properly equipped in its fire department and has proper fire prevention laws. The law in Boston limits the height of buildings to 125 feet.

I have not used the word "zones," because it seemed to us to be too comprehensive, and therefore I have used the word "divisions."

While on the subject, I believe it would be a good plan for us to get a uniform floor area. I believe New York, Boston and all other cities are all different. I believe this Convention could come to some uniform floor area on which we could all agree.

MR. EVANS: Mr. Cole's paper, as well as Mr. Clark's, strayed somewhat into the very closely related subjects of building codes and protection, but that merely shows that no arbitrary division on these topics can be made. These topics were to call attention to certain phases of the question and not limit the question itself. When you have a paper delivered by a man who represents not only the scientific or engineer's standard, but also the standard of a great city bureau, you get an insight into what is practicable—legislatively and politically. It is not always the shortest cut to find out what is the best thing to do unless we have the means with which to do it; and the experience of a city official is an admirable filter through which to try out our scientific knowledge. I will call for discussion now on these two papers.

MR. GUERIN: I think we will have a very hard time on this proposition. We must come right back to Mr. McDowell's standard and ask the question: "How are you going to do it?" You can't do a thing unless you have the police power to enforce it. Now the question is whether the police power of a State is capable of telling a man: "You shall not conduct your business within a given boundary." If you can do that, you can enforce your zone system. To give you an illustration: A man proposes to manufacture dynamite in the heart of Philadelphia. You say, "You can't do it." He says, "I am going to do it." Your recourse is the law. If he can go into court and show that he can so construct the building in the heart of Philadelphia and can manufacture dynamite without injury or risk to anybody else, you cannot stop him. But if you show that he is a nuisance, a public danger, you can do it. The only way you can drive him out of a zone is to show he is a public menace. Then the boundary of zones would be limited.

MR. CLARK: I would state that under the Act of 1911 the Philadelphia Fire Marshal has unlimited discretion in the matter. If he deems it is an especially hazardous pursuit, he can prevent it in a congested district. Again, the legislature might pass laws to prevent the erection of buildings for that specific purpose. If, however, the man can build a building and prove to the court it is not specially hazardous, it falls out of the category of hazardous pursuits.

MR. COLE: One act did pass in Massachusetts and we have had the law for some years. Nobody can manufacture explosives or fireworks within the city limits of Boston. We have fire limits in Boston and recently have extended them. They have been in effect for 25 years. So it would seem that the Massachusetts Legislature has the necessary police power to do that. In addition to that, we control the storage and use of explosives after manufacture by means of licensing both by the city and State authorities.

MR. GUERIN: Of course, I place this in an extreme light. In a certain section of the city of New York where dens and drugs are common—the lower East Side and Pearl street, a district surrounded by quite valuable property—I am positive you could not to-day go into the courts of the city of New York and drive that drug and opium trade out of its present location, nor prevent it from going into another district where valuable property is located and the population is very large. I don't believe the courts would sustain you and say, "You shall not build a building that does not comply with the highest standards of construction." I am reasonably certain. I am quoting the question of extreme hazard more as a shock than anything else but I contend the zone system could not be enforced.

MR. F. E. CABOT (Boston): I am sorry to contradict Chief Guerin. The Massachusetts Supreme Court has decided that the city of Boston has a right to limit the height of buildings and to limit within certain zones—within the territory that is known as the Back Bay—certain characters of occupancy which cannot be used except under certain definite restrictions; and that decision was sustained by the Supreme Court of the United States.

MR. GUERIN: May I ask the last speaker what case was carried to the Supreme Court and so decided?

MR. CABOT: The case referred to was that of Walsh vs. Swazey; and there was, first, an act by which there was division into two zones.

NOTE.—*Re* HEIGHT OF BUILDINGS

DEAR SIR:

In reply to your letter of 24 September, 1913 (re limitation of heights of buildings), I think the case you refer to is Welch vs. Swasey, 193 Mass. 364, affirmed 214 U. S. 91.

There is another case that may be the one you refer to, namely, Attorney General vs. Williams, 178 Mass. 330.

I have forwarded your letter to Mr. Flynn, Assistant Corporation Counsel of the City of Boston, who was junior counsel in the first case, and he will give you the particulars of the case direct.

Yours very truly,

CHAS. H. COLE
Fire Commissioner

MR. ANDREW WRIGHT CRAWFORD (Philadelphia): It seems to me very desirable, in general, that a convention should get after what it wants and leave the question of working out the law to the lawyer. Perhaps I should say I am a lawyer and naturally would take that view. Nevertheless, in regard to this case I have recently said to a gentleman in Philadelphia, for whom I have a great deal of respect, that they should limit the height of buildings in Philadelphia to 125, 100, 80 or 60 feet. "Where draw the line?" he asked. I said, "In the middle of a street." He said, "You would permit a man on one side of the street to build up to 125 feet, and say to his opposite neighbor, 'You can go only to 80 feet'"? I said, "Yes." He said, "No court in the United States would uphold any such obvious injustice." Yet there were seven on the Supreme Bench of Massachusetts and nine on the Supreme Bench of the United States who upheld that kind of "obvious injustice" in the case of Walsh vs. Swazey.

You have in that case the zoning, or I should say, the districting system of Germany enforced; and that was done chiefly for æsthetic reasons and not primarily for safety reasons. And as that was the chief ruling motive for that legislation, you can certainly do it for fire-preventive reasons. So you must hesitate because of what the courts may or may not do; and if, as in the case of New York, you find a decision on the ground of unconstitutionality it may prove a great education for every other court in the country. I would say that in one case where the Supreme Court decided that an act was unconstitutional, it has made such an impression that every State Supreme Court has declared it unconstitutional. But if you can educate the public, and along with it those who sit on the benches, to see what you are driving at I think you will arrive at a method of sustaining it.

MR. EVANS: Mr. Crawford is not only a lawyer—he admits that—but he is very active as one of the secretaries of our Art Jury, that cares for one phase of this work in this city. He is interested in the whole housing movement in the State and the country, and hence speaks on this subject with much interest and experience. If I may be permitted, without taking too much of your time on this one point, I would like to give an illustration as to how, with present regulations, the zone question can be worked out to a successful control. We had recently a very bad oil fire here. The question came up as to reconstructing the burned buildings. Under the law the Fire Marshal had nothing to do with the buildings except controlling dangerous conditions. Obviously the construction of a new building was not a dangerous condition. The law permitted the construction of a building for this occupancy if the building was all right. In the first place, the owners could put up a building because the building was all right. Then they would go to the Fire Marshal for a permit. The Fire Marshal would say, "No; not for that purpose."

The sensible course under these circumstances was that the Fire Marshal should combine with the Building Inspection Bureau and work out jointly a satisfactory construction and occupancy solution. In this case it is working reasonably well. That is the rational way to solve such matters while waiting for the laws to adjust themselves from time to time.

MR. COLE: The Boston law says that within certain fire limits there must be only first-class construction. We issued a permit for a building and did not receive a permit from the fire department. Since that time we have refused to issue any permits either for approval or disapproval; it practically places the issuance of permits in the hands of the fire department. So there is a special class of buildings. The same is true in the case of picture films, which can only be stored in certain buildings under certain conditions.

MR. KILLAM: In connection with what you have just said about one authority approving plans before finding out whether the other party approves, what Mr. Cole has said about the fire department being given more power than now in the approval of plans presents, I think, a very serious administrative problem. I am on a commission in Massachusetts to investigate laws throughout that commonwealth relating to buildings, and one of the things we want to obviate is the confusion of control which now exists. In Massachusetts, in a great many cities, we have to get a local building inspector to approve plans. Then in some cases the district police, a State organization, inspects certain classes of buildings. The boards of health, either State or local, also have large powers. Mr. Cole, as fire commissioner, must now approve some building and I believe he is going to get in on more later. I have thought that the operation of obtaining building permits becomes unnecessarily complicated if it takes all these experts to decide whether a building should be built or not. They ought to get together so that the architect or builder can apply at one office and get his permit without chasing all over the State, as a western Massachusetts man has to do now before he can build certain kinds of building. It is a difficult problem, perhaps, but each of these inspecting authorities is likely to be a kind of narrow-minded crank. The fireman is likely to look at it from the point of fire-fighting alone. The building inspector will not be a fire-fighter. The head of the board of health may be a political doctor. They all ought to get together before the issuance of the permit and give their united opinion, so that a man can go to one place and get his permit.

The gentleman from San Francisco has rejoiced that the architects are waking up to the advisability of fire protection. He ought to be informed, as a great many others, that the architect does not build to suit himself, as he would want his own building, but to suit the owner who pays for it. I went into a department store at Chestnut or Market and Thirteenth streets that has an open interior court running up the whole height of the building—a most idiotic fire-trap or smoke-trap. The architect of that building knew better, I know; but the owner of the building, if he knew better, didn't care. That is the fellow who needs educating. We are no longer allowing those dangerous open courts in Boston.

I should like to ask how much advantage there is in a brick exterior wall as compared with a clapboarded frame wall in a conflagration. Is the building with a brick wall much better than a clapboarded frame wall so long as we allow the ordinary wooden window frames with thin glass? Will such a brick side wall, full of openings, resist conflagration hazard enough better to warrant requiring it throughout an entire city, for instance?

Mr. Edwin Clark: I consider that as regards framing and brick-wall construction the brick wall is incombustible, the frame wall is not—it add fuels; consequently the fire is greater. Therefore I think it is more desirable to have brick-wall construction than framework construction. I would like to say to Mr. Cole relative to his paper—in his paper he cites classification of buildings. I think in all the large cities there is a classification of buildings. I know Philadelphia has, and it is quite strict. Does he think Philadelphia is on a perfect basis as regards conflagration?

Mr. Cole: I don't think any city is on a perfect basis as regards conflagration.

Mr. Clark: I mean, your paper cites a certain classification. I think Philadelphia covers most of the points cited in your paper, with the exception of the sprinkler system. To my mind, I think that in Philadelphia there should be a fire zone and only fire-resistant buildings erected in that zone.

Mr. Ballinger: I was interested very much in both papers, but it struck me, as Mr. Clark finished, that his last suggestion was in the nature of "locking the stable door after the horse is stolen." I don't mean the suggestion he just now made, but the one in his paper. If I remember accurately, it was to the effect that after the property value reached a certain amount all buildings thereafter should be of first-class construction.

Mr. Clark: Correct.

Mr. Ballinger: It seems to me that Mr. Cole's suggestion in that respect would more nearly fill the bill, if I understood him correctly; that is, the size of the building, or rather the character of the building, should be governed by the amount of ground covered. If there is 90 per cent. of the ground covered there should be first-class construction. If between 30 and 40 per cent. it should be in the second class. Of course, a difference in meaning should be pointed out as to second class. I believe the thought in Mr. Cole's paper, carried to its logical conclusion, would give us a basis for State building legislation as well as in the congested sections of the city—and very desirable. We have occasion to build in the city of Pittsburgh, and I am up against the law there passed for cities of the second class, the same as passed in Philadelphia for cities of the first class. A great many of the regulations are different, though passed by the same legislature for the same conditions. If the thing is right or wrong for Philadelphia it is right or wrong for Pittsburgh, and I hope the commission now preparing the new State building code will prepare a code applicable all over the State with administrative features adjusted to local conditions.

MR. COLE: I wrote that paper, and I hope that if there are any holes in it they will be kicked in.

MR. GUERIN: I don't want to rob the lawyers of their province at all. My previous remark was made only to start the lawyers going, and I would suggest that the Chairman have the lawyers of the body prepare a law that will stand fire in the courts.

MR. EVANS: You have asked me to do a hard thing. Sometimes I would like to stop the lawyers and not get them going.

MR. OLE O. ROE (Iowa): We, who have to help enforce the laws, these fire-prevention laws, should not be timid as to what the courts will probably do. We should be willing to thank God and take courage. From the remarks that I have heard the trend of decisions is toward better protection of life and property. What the courts would probably have held to be an unreasonable ordinance 25 years ago they would probably hold to be reasonable now. When we were pioneering in the West, building frame houses and frame towns, we didn't think much of the prosperity we now enjoy in Iowa. I think our courts out there—in fact I know—will go to great lengths to sustain the reasonableness of ordinances providing for the better building of our smaller cities and towns. I am sorry that Mr. Cole limits the application or adaptability of his remarks to cities of 200,000 or over. I think there is much in it that could be readily adapted to cities and towns of 10,000, if the people are willing and are educated up to the idea—and they are being educated up to that. That is the meaning of this fire-prevention movement. It is the first great step to prepare not for a year or for a few years, but for a thousand years; and when we have aroused our people who live in our cities and towns and even villages on this question that their children and grandchildren are not here for a year or two, but America is here to stay, we will have better buildings and the courts will come up with the procession as to reasonable ordinances.

MR. EVANS: Mr. Roe speaks with authority as the Fire Marshal of Iowa, and I think he has accomplished his purpose of amending Mr. Cole's paper by simply reading his views into our Record.

MR. RALPH BARSTOW (Rochester): The thing that has been running through my mind as I have listened to the discussion of these papers as to fire limits, zones or districts, is that—with respect to the plans proposed—instead of a group of men determining the fire district, the district has rather determined for itself what it should be. Is it possible for us in America to adopt something of the idea of Hamburg (I believe

I am right) where certain sections are set aside arbitrarily for certain work? In other words, could we as citizens of the United States set forth arbitrarily that in a certain district buildings below a certain standard would not be allowed? In providing for the growth of the city it is of little use. We in Rochester, at least, although we have an excellent building code, have no fire limits at the present time, because within the present fire limits are many buildings not conforming to the standards, and no provisions to bring them up to date. Now your fire limits must be larger, it seems to me, than the built-over territory to allow for the increase. Whereas in these two plans it seems to me that after the building has been virtually completed in any community or part thereof you then propose to legislate for it.

MR. CRAWFORD: I may answer, it is what is called the German zoning system, which is related to various matters, not merely one. Its object is to better the population through better housing laws, and through the segregation of various industries for various purposes. It is called a zoning system, and in certain cities it is strictly that. The further out you go the fewer houses there are to the acre. Twelve to the acre is the lowest point they reach, and while you may within one or two miles of the center of the city build as high as five or six stories, the further out you go the more the height is limited, and at four miles you are limited to two stories. That is not strictly adhered to in the German zoning system. The zones dovetail into each other near the center of the city. As to whether it is adaptable to other cities is apparently a matter of education. No doubt, I am sure, the courts would knock it out as unconstitutional; but if you follow the precedent of Walsh vs. Swazey I think it could be worked out.

One principal feature of the city planning idea is that your main thoroughfare should be very wide, while the smaller roads are decidedly narrower than now, providing you limit the height of buildings in relation to the width of the street. The fire barrier, I think, is offered by parkways like those erected in Kansas City, Boston, etc. Here in Philadelphia it has been proposed, instead of building a subway under Broad street, to provide for a parkway on the line of Eighth street of 200 feet in width. Based on the present cost of construction this would cost five to six millions more than the Broad street subway—thirty millions net. Would it not pay the city of Philadelphia to create a fire barrier 200 feet wide rather than build a subway under Broad street? The question was hardly more than suggested by resolution in Councils in answer to one as to the cost of condemnation of land, but it seems to me that as every city in America is reaching the stage that European cities have been facing for centuries—reconstruction—in that you have a great method not of preventing fire but of limiting the conflagration area. That is where the city planning of the country can be of great assistance to you. In this matter of zones or districting, if you take your time and understand that the men sitting on the benches are human, and if you will take the time to educate them up to the idea of the German zoning system you will accomplish your result. We are getting the various elements gradually together, and in due course the completed structure is bound to come if you don't try to do it all at once.

MR. B. F. BETTS (Philadelphia): Referring to Mr. Cole's paper, I followed it pretty closely as a whole, and I think he has been rather unfair to one industry—that of lumber yards—in suggesting that they should either front on streets 150 feet wide or have fire walls. There are no such walls in Philadelphia, and lumber yards must be within easy reach. I believe some other provision for lumber yards can be taken up, such as placing them on corners, limiting the area and making the walls surrounding them not necessarily brick walls, but of fire-resistant construction. According to his plan it would be practically a case of forcing lumber yards outside of the city—outside of the third section—and requiring delivery at greater expense to the older portions of the city.

MR. COLE: We have spent much time in Boston on the question of metropolitan fire hazard. Last winter we had a lumber fire where the heat was so intense that the firemen could not get near enough to fight it. We nearly lost our fire headquarters near one lumber yard. And we have a city hospital near some lumber yards. For that reason we put in this paper something in regard to that hazard. A fire wall around a lumber yard is not a very expensive proposition, because the lumber is not piled very high. Of course, I didn't go into details. The division of lumber yards by wooden fences would limit the areas, but wooden fences will not serve to stop a fire in a lumber yard. It would not cost so much to build a fire wall or brick wall around most of the lumber yards within the city limits. Most of our yards in Boston are on the docks. In Philadelphia I don't believe you are situated so well, but I do not believe the cost would be prohibitive.

MR. EVANS: Any other remarks? (Pauses.) It seems to be a case where one man's meat is another man's poison. The greatest good to the greatest number will be a matter of compromise on these subjects finally.

If there are no other remarks on that subject, we come to the language of the resolution upon this topic.

Mr. Crawford moves, and Mr. Mason seconds, the motion that the resolution be adopted as read. Motion carried.

Mr. Evans: The Engineers' Club, 1307 Spruce street, has very courteously extended to you all an invitation to use their clubhouse during your visit in Philadelphia. I want to take this occasion to call attention also to the loan of the very interesting series of fire pictures around the room by the management of *Safety Engineering,* who went to a great deal of trouble to mount and send them here for our use this week—a very illuminating exposition of fires in property.

On motion, adjourned until the following morning.

Resolution Adopted Under Topic 2

"It is the sense of this Convention that:

Populous communities should be divided into danger zones; wherein rules reasonably limiting, defining and regulating the presence, form and use of property may be legally imposed, with due regard for the present and near prospective congestion of life and property in such areas."

SECOND DAY, MORNING SESSION

Tuesday, October 14, 1913

Topic 3—"Building Construction"

NOTE.—On any selected site the consideration next in order is the actual unit *building* fire hazard—in design, specification and construction.

The meeting was called to order at 9.30 a. m. by the Chairman.

MR. EVANS: The first topic this morning is on "Building Construction," under the tentative resolution announced. The topic immediately following this will be the *sum* of building constructions, which is "Building Codes."

The first paper on the subject deals with the "Life Hazard" of *unit* "Building Construction;" and will be presented by Mr. Porter, long recognized as an authority on the life hazards of building construction.

We will have the pleasure of seeing some of his lantern slides next Friday evening, together with Colonel Bryant's moving-pictures of people at fires.

"THE LIFE HAZARD IN BUILDING CONSTRUCTION"—1

By Mr. H. F. J. Porter, Engineer; and Mr. A. L. A. Himmelwright, an Associate Engineer; both of New York

All buildings may be divided into two general classes, fire-resistant and non-fire-resistant.

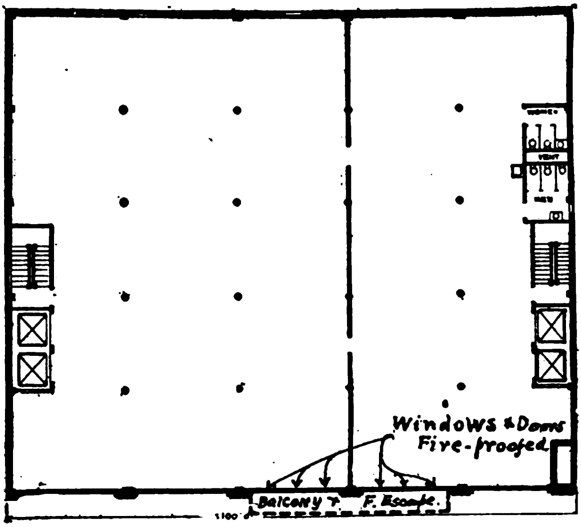
Of late we have advocated the unrestricted use of fire-resistant construction in all buildings which are to be occupied by more than fifty persons above the first story. We also recommend the development of a form of exit test or drill of the occupants of every building to determine if, in case of danger, they could escape from the building or to a place of absolute safety within three minutes after the sounding of a fire alarm; and, if escape cannot be accomplished within that time, that the number of the occupants of the building be reduced or the character of the exit facilities be increased until the occupants of the building can escape within that time. The time limit of three minutes has been determined upon only after conferences with many persons who have studied the fire problem, and who do not consider it safe to remain in a burning building longer than that time.

In every building, irrespective of the number of occupants, at least two separate and independent means of exit or escape to safety should be provided for each floor space or story. Each of the two exits should have sufficient capacity to fulfil the requirements of the exit test or drill referred to. This capacity is necessary, as either one of the two exits is liable to be cut off by fire. Similarly, when more than two exits are necessary or are provided they should be of sufficient capacity so as to fulfil the requirements of the exit test in case anyone of the exits should for any reason be put out of commission. These are the basic principles upon which safety to life depends.

Mr. Porter's application of one or more fire walls to fire—separate areas.

A BISECTIONAL BUILDING

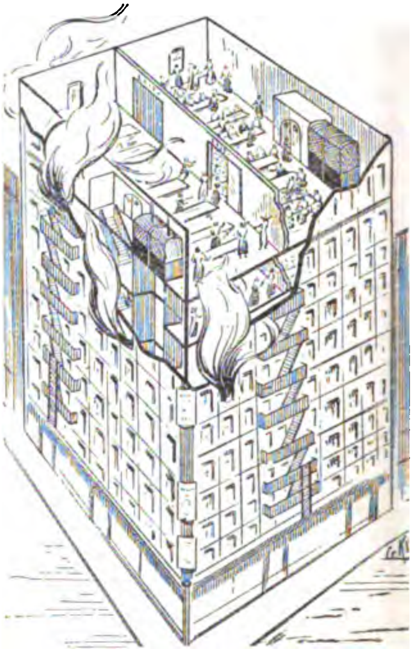
Floor plan of typical loft building showing fire wall with doorways. The fire wall restricts the fire to one-half the building, allowing occupants to escape horizontally from the fire as if they were on the ground floor. The fire balcony and escape may connect two areas in one building, or two adjacent buildings.



FIRE IN A TYPICAL LOFT BUILDING

(See pp. 80-81 for further fire escape diagrams.)

Hundreds of people on each floor jam the narrow stairs and fire escapes in panic. The elevators become jammed and on account of the smoke and flames are quickly put out of commission. Those who are not caught on the stairs either jump from windows or from the fire escapes when the fire reaches them.



Loft building with fire wall which confines the fire to one-half of the building. The occupants of that half merely pass through the doorways of the fire walls, close the doors after them, and are out of the reach of the fire. They do not have to go down stairs at all, but if they wish to do so the stairs and elevators will be found in normal condition without flames or smoke in them. The doors are fireproof and self-closing from the heat of the fire, and only half the property is destroyed as a rule.

The fire hazard to human life in buildings is influenced by (1) the materials used in construction; (2) the design; (3) the facilities for escape to safety, and (4) the physical and mental condition of the occupants.

As to the materials to be used in the construction of safe buildings it is self-evident that they should be durable, incombustible and employed in such manner as to overcome any inherent defects or weaknesses of the materials. Unfortunately a building, even when constructed of fire-resistant material, and equipped with every safety feature and device, may yet be filled with inflammable and combustible contents, the consumption of which by fire would generate gases, smoke, and heat sufficient to destroy the lives of all the occupants. Well-designed and constructed fire-resistant buildings will, however, confine a fire to the space in which it originates, so that only the occupants of that space or story are actually exposed to serious danger.

The safety of the building is largely influenced by its design. The maximum separation of the exits, the safe enclosure of the stairways and their character of construction, the proper introduction of fire walls and the character and degree of the fire protection, are all important details. In order to secure economy of design it is necessary that the purposes and uses of the building should be definitely known so that the correct amount of fire protection be provided against the exterior fire hazard for the metal structural members, dividing walls or partitions, fire doors, and by fire-extinguishing apparatus and equipment. This is an extensive subject which cannot be treated within the prescribed limits of this paper.

The usual means of exit or escape are (1) elevators, (2) outside fire escapes, (3) stairways, and (4) the fire wall. Experience in fires has demonstrated that the elevator service cannot be depended upon as a safe and sure means of exit in a burning building except under certain conditions which will be referred to hereafter.

Outside iron fire escapes have been installed as a means of escape for many years. They have many weaknesses and defects that are now well known. Their presence on the outside of a building is evidence of the lack of safe egress facilities on the inside. Except in small warehouses and exceptional cases they should be prohibited by law and safer means of escape provided. Fire escapes of the chute type are steel tubes with a smooth helix instead of steps. If the only entrance is from one level they have considerable capacity. They soon rust, however, and become useless. At best they are a ridiculous attempt to supply safety to an otherwise unsafe condition and should not be considered seriously as a means of safe exit.

The smoke-proof tower, claimed to have been originated in Philadelphia, has lately been put forward as the latest improvement in the line of fire escapes. It is simply an enclosed stairway on the outside of a building but cannot be reached except by going out of doors. Of course, it may be inside the building but it cannot be reached except by going into the open air. Its special claim is that smoke and flames cannot get into it. It has, however, no more capacity than any other stairway of the same width, and as its approach is always open to the weather and its interior is always more or less dark, it is seldom used in ordinary service and becomes neglected. The whole space devoted to fire towers is, therefore, almost a total loss to the owner. The capacity of a stairway, if time is not a factor and a stream of people pours into it at the top or through a single exit and out of it from the bottom, is unlimited; but if time is to be considered the capacity is limited by its cross-sectional area. In a multi-story building, with crowds of people on each floor trying to get into the one stairway through exists at each floor level in a limited time, the conditions are very different. If more people try to get into the stairway from each floor than the portion of the stairway between that floor and the floor below will hold, a jam will occur so that the flow downward will be delayed and in many cases cease altogether. The capacity of an average stairway with exits opening into it at each story is limited to about 12 persons per story for each 22 inches of width.

Tests of the capacity of fire escapes in a limited time give the following results per average story: A straight ladder, two persons; ladder set at 50 to 60 degrees with the horizontal, requiring people to go down backwards, three to four persons per floor; stairs 18 to 24 inches wide, 10 to 12 per floor; and the modern outside stairway, with a mezzanine platform 40 inches wide, 20 to 24 per floor, the same as an inside stairway.

There are actually only two kinds of safe exits: the enclosed fireproof stairway and the fire wall; and the former has serious limitations and is not suited for crowded buildings. Safety by stairways can at the most only be realized in buildings of 10 stories or less in height, with the maximum limit under favorable conditions of 12 stories in height, and where the number of people per floor is small. It has been demonstrated by the operation of fire drills that physical exhaustion occurs when employees are taken down more than 7 or 8 stories or up 3 or 4 stories. When persons become excited they are very liable to stumble and slip; or, if they become fatigued, they are apt to fall, causing others to tumble over their prostrate bodies and jam and obstruct the stairway so as to render it useless as a means of escape. A crowd of people does not flow like a liquid composed of round, smooth molecules. Their soft bodies are angular in shape, more like pieces of rubber with wires in them, and they therefore interlock. Clothes present rough surfaces, causing friction, and if the stairway is narrow an arch is apt to form across it which can become an obstruction in case of pressure from above such as actually to burst the stair rail or enclosing partition. There are numerous instances that can be cited where jams have occurred so as to completely fill and obstruct these stairways. In some instances the bodies have been packed so tightly that it has required a considerable time for policemen and firemen to disentangle them and open the stairways. In at least two instances this has occurred when there was a false alarm of fire and there was no real cause for the panic.

In view of the foregoing facts it is evident that in buildings more than 10 or 12 stories in height safety for the occupants must be found by some other means than by stairways. Notwithstanding this obvious conclusion and our most strenuous protests during the last two years, nearly all of the recent high office and loft buildings are featured with these dangerous and expensive fire towers on which dependence is placed for safety.

The only real and practical solution of the problem of safety in high buildings is a fire wall. We make this statement after the most careful study of the subject in all its phases. Further than this we do not hesitate to say that it is by far the most efficacious and the least expensive solution of the problem if properly and economically applied. There is, unfortunately, a widespread prejudice against the fire wall, but this is largely due to the lack of knowledge of the manner of its application to the life hazard. We are satisfied that when the economy and efficiency of this device are once understood and established it will be universally adopted.

The merits and advantages of the fire wall as a safeguard and protection to property have long been understood and recognized by underwriters and insurance interests. Its adaptation as a solution of the fire hazard to life, while the same in principle, is in many cases very different in its practical application. Where the fire wall is introduced it so changes the conditions in buildings that large economies result in the cost of the exit facilities that would otherwise be required. This economy in most cases more than offsets the entire cost of the fire wall and materially reduces the total cost of the building. There should be at least one stairway and one elevator on each side of the fire wall and the wall should have at least two openings in it at as great a distance from each other as practicable, and both closed by standard self-closing doors.

It is improbable that a fire will occur on both sides of the fire wall simultaneously. It could occur only by incendiary origin, and that would hardly be possible in working hours. Should it occur on one side, the people on that side would go through the doorways in the fire wall, close the doors after them and be perfectly safe. That half of the building in which the fire occurs can usually be emptied in less than a minute if there are not more than 300 people on each floor, and an average of 150 have to pass through the doorways. If the principle of the horizontal escape presented by the fire wall is correctly applied in the design of new buildings a most satisfactory method of securing safety at comparatively small expense will be obtained.

In every way possible the horizontal escape should be encouraged and developed in old buildings, and especially in non-fire-resistant buildings, and the vertical escapes subordinated. Factory buildings adjoining one another may have doorways through their sides closed by fire-resistant self-closing doors connecting them on various floors, or they may be connected by outside balconies built around the party wall; or, if of different heights, doors in the sides of one may lead out on the roof of the others.

The fire wall bisecting the building makes practically two buildings, each provided with elevators and stairways. A fire on one side of the wall would be confined to half the building, and therefore the property loss would be reduced one half. Only half the people would be endangered and have to move, and the distance they would have to go would be only half what it would be if they were on the ground floor of a building without a fire wall. They could remain on the same floor until the fire was extinguished, or could go down to the ground by the elevators which will then be operating under normal conditions. The fire wall eliminates the necessity for a fire drill with its accompanying objections. Thus the "bisectional building" can be seen to have many advantages.

All buildings occupied by many people should have a fire-alarm signal system in them to advise the people promptly in case of danger. In buildings where there are fire walls the signals should be arranged so that in case a fire should occur on one side of the fire wall on any floor, a bell on each floor on the same side of the fire wall would ring, indicating on which floor the fire is. Then all the people on that floor and above it should pass through the fire wall and close the doors. Those below, if the building is of fire-resistant construction, need not disturb themselves until the fire threatens them, and then they too can pass through the fire wall. The fire wall should be introduced into all buildings where the public congregates in great numbers. Large department stores, which on certain days are said to accommodate several thousand people per floor, are very dangerous places at present. A fire, or a panic without a fire, might cause a fearful tragedy. It is criminal for their owners to object to fire walls and offer as an excuse that they would obstruct the vista. Certain cities require fire walls in such buildings now as a property protection, and the vista is dispensed with without comment.

That is true in this city, and I think there are other cities in this country having the same laws, but these fire walls have been put in for property protection and not life protection. In this city the Wanamaker building has two splendid walls for property protection, and several smoke-proof towers, with instructions that they must not be used except in case of emergency. The result is they are never used, and are now obstructed with furniture; and they will never be used, as nobody knows anything about them. They are entirely a waste in that building.

Churches, assembly halls and similar ground floor buildings should have their floors fire-resistant and unpierced so that any fire occurring in the basement would not endanger the occupants of the main building. The fire wall can also be necessarily and economically applied to theaters, moving-picture buildings, hotels, apartment houses and even to dwellings. Every school building should be divided by a fire wall providing a horizontal exit on each floor, so that the children will not have to be drilled to go downstairs in case of fire.

Hospitals where the inmates are bedridden, blind, lame, invalid, imbecile, or otherwise helpless, can be made safe by the introduction of the fire wall between wards, and in case of fire those who are bedridden can be wheeled on their beds through the doorways, and those who are up and about can walk through them. We are now arranging 200 buildings of the Department of Charities in New York City so that invalid patients may be protected by wheeling them through the fire walls on their beds.

We advocate legislation requiring (a) that architects and builders be prohibited from designing buildings which cannot be emptied within 3 minutes after a given signal; (b) that the municipal authorities be required to institute an exit test in each building as soon as it is fully tenanted to determine if its proposed number of occupants can reach safety either through a fire wall or by stairs to the ground in 3 minutes; because, if it cannot pass this test the proposed number of occupants should be peremptorily reduced until it could be altered so as to pass the test; and (c) that the proper authorities afterward be required to repeat the exit test from time to time, to see that the safe conditions originally established are maintained.

MR. EVANS: You have heard a very authoritative statement on this matter of life hazard in building construction. I will now ask Mr. H. W. Forster, Manager of the Independent Inspection Bureau (Phila.) to give us further comment on this same subject. Mr. Forster has had very wide experience in insurance engineering, and I think his viewpoint will be well worth while in this connection now.

MR. H. W. FORSTER (Philadelphia): The thing that is worrying me is that I have only 7 minutes—the Chairman says "10 minutes." I will take ten gladly, and feel that I should be an expert in epigrams to get these choice remarks to stick in your minds. We have listened to an excellent paper on exits in buildings. There is little doubt that the horizontal division wall, placing the elevators and stairs on each side, makes an ideal building in regard to safety to life; but, unfortunately, we have thousands of buildings which are life-menaces, and we can't persuade owners to put in division walls making them safe to life. If I had my way about it I should be very liberal with other men's money. Given a fireproof building with open stairs, we have a menace to life that will be demonstrated one of these days. I cannot see how these vertical shafts will escape a holocaust making the Iroquois Theater a second-rate proposition. The buildings which are up to date make use of enclosed stairs with wireglass.

The architects occasionally (and there are some here) enclose the elevators and leave the stairs open. Where the logic is I fail to see. The elevator does not afford a ready means of egress for a large number of people. If the stairs are open they do not either; and if the elevators could be used, the open stairs alongside make it impossible to get to the elevators because we all know that fire and smoke travel upwards through these vertical shafts. I believe, therefore, that with the existing fireproof building, as well as those to come, there should be a requirement for the complete enclosure of elevators and stairs and any other vertical openings through floors; and it could be done at a not prohibitive cost.

Now for the next feature of fire-resistant building. I may be wrong but I think it should be possible to remain in one of the upper stories of a fireproof building, and remain there safely while a fire raged below. If our elevators and stairs and other vertical flues are cut off, we have an impediment to reaching the upper stories through the windows; and we know from the San Francisco and Baltimore disasters that the fire did travel from window to window—not fast, perhaps, but steadily; and a person in the twentieth story thought it was coming to him "to beat the band." The same principles apply substantially to the same extent to the non-fire-resistant building, because even if your floors are combustible it is true the vertical opening does two things to a building on fire: first, accelerates the speed of the fire in any one story, creating a draft; and, second, acts as a medium for the spread of the fire. So the enclosure of the elevator and stairs in present buildings is necessary. I believe the fire departments could get on the job with extension ladders in from 5 to 7 minutes. Also, if the vertical openings were closed and doors shut, the building would be reasonably safe in the upper stories until the fire department came, especially if wireglass is used in addition.

I have spoken of wireglass. Tinned shutters answer very well, but you cannot expect people to reach out at the risk of their lives and close several hundred shutters with a fire below. Another thought is that the present fire escapes are entirely inadequate, partly due to miserable design, but largely because the fire escapes in the ordinary building are small and steep, with grilled platforms and stairs. They had an experience with them in Binghamton, New York. I had the opportunity to go to Binghamton after the recent fire to report for the National Fire Protection Association. A number of people were burned to death on the fire escape, equipped with platforms 36 inches wide, 8 feet long, and the stairs had an angle of 70 degrees. At the bottom was a drop ladder, and a photograph proved that the drop ladder was let down. Yet the people were burned here because they were overcome with fire and smoke from the windows—the windows not closing to protect the people in the building or those on the fire escape. It is also my honest belief that the windows leading to the fire escape section should be of strong wireglass, and that access to the fire escape should be secured from a causeway, the windows to be placed on both sides of the stairs proper, with access to an extended balcony.

The enclosed vertical opening, the exterior window, and the protection of the fire escape, plus a respectable, decent fire escape, are principal points. Most of us have such specifications available in our city ordinances or otherwise; and we are going to work on that proposition.

I am limited to building construction, but will step beyond that a moment. Given a building of the ordinary combustible construction type, and the problem is to make the proposition safe for life. I would leave out division walls and elevator and stair enclosures if necessary, *but I would sprinkle it.* In our National Fire Protection Association we have records showing something like 16,000 fires in dangerously occupied buildings—cotton mills, celluloid factories, wood-working establishments, etc. That is where fires have taken place and sprinklers have handled them in fine shape. The recent Binghamton fire occurred in a factory building insured for about $20,000, with about $50,000 worth of contents. The cost of putting in a sprinkler system supplied by the excellent city mains would have been $1200, and thereby the insurance reduction would have been $300 per year. You could not have burned the people in that building with a sprinkler system operative in it.

The proper enclosure of elevators and stairs and fire escapes does not provide the safety accomplished by the sprinkler system, and the insurance return is practically nothing. We must think of the pocketbook of the man.

There is one last thought I would leave here with the men representing the lawmaking element—that the *automatic sprinkler system is the one best life-saver* and *the one best property-saver.*

Mr. Evans: Mr. Forster handles all his work with expedition and to the point, as you have just had opportunity to observe. That is why we always are glad to have him on commissions of every sort.

The second paper on this "Life Hazard" division of this topic is by Mr. John Price Jackson, of Harrisburg, Pa. He is the Pennsylvania Commissioner of Labor and Industry, who has comparatively recently been appointed to direct this very important new office by the Governor, and is very thoroughly equipped with authoritative experience in many respects from the standpoint of labor rather than from that of purely physical and structural knowledge of buildings. In his enforced absence this morning I would be glad to have a volunteer to read his paper. If there are no volunteers I will read it myself.

"THE LIFE HAZARD IN BUILDING CONSTRUCTION"—2

By Mr. John Price Jackson, Commissioner of Labor and Industry of Pennsylvania

Instructions were received that this paper is not to detail methods of building, but it is rather to present a general statement of conditions required for minimizing danger to life through fires.

Any person who will take the time and trouble to carefully investigate large buildings located almost anywhere in this country in which great numbers of people are congregated, more particularly for industrial purposes, will find in many instances that conditions exist which are a serious menace to life through sudden fire. As an illustration, one large textile mill, having four floors, is filled with inflammable materials used in the course of manufacture. This material consists of stuffs ready or in process of manufacture and finished products. All of this is not protected in any way from fire, nor is the large amount of waste material which is continually swept aside from the machines.

The building is of brick, but the floors and finish are of wood and are saturated with oils, which make a most inflammable condition. An elevator rises through the center of the building, which does not have fire-resistant doors, and makes a most excellent draft funnel to promote a fire. Fire-tower stairways are provided for the occupants, but these are constructed with wooden treads and wooden partitions and the doorways have no special fire-resistant or fire-prevention features. Indeed, the doors contain ordinary glass windows, of which the glass is in many cases broken out. The stair towers open directly into the factory building floors and are of a character which will permit the towers to become funnels for flames and inaccessible for passage to the ground. It may be well to explain here that tower fire escapes, or fire towers, are stairways enclosed by four fire-resistant walls opening at the base to the street. They are usually erected within the building to be protected, although this is not necessary.

The building is large and has 150 or more female employees on the top floor; equal numbers working on the floors below. When the enormous amount of highly inflammable material which could readily burst into flames in a brief period is considered, the chances of terrible loss of life in this establishment are appalling.

The illustration is typical of a large number to be found in this country, equally dangerous, though possibly differing in details as to the character of the hazard.

In the erection of new buildings or the reconstruction of old ones the architect is preëminently the one to whom the liability of danger due to fires should strongly appeal; for if, in after years, the building of his design should burn with great loss of life and suffering he must be held in many cases as originally responsible. Every architect in designing a building should carefully bear in mind that the subject of fire risk is one of the important elements with which he must deal in working up his design. To do this he should know in full the character of the use to which the building is to be put and the number of employees or occupants to be housed therein. Had the architect of the building spoken of as an illustration above kept this important feature in view while making his design, he would undoubtedly have so arranged the elevators that they could not to any extent act as a promoter of fire, and would have designed and constructed the fire towers in a manner which would, as far as is possible with human materials, have prevented flames or smoke from entering them. He would certainly have made the latter fire-resistant. In addition to these most obvious changes he would likely have insisted on floors which were not inflammable and which could not, as in the case described, become absorbers of oils and to the highest degree ready to burst into flame upon the slightest provocation. He would also, had he properly considered the fire risk, have prepared and arranged in the building suitable fire-resistant storage bins for inflammable materials used in the course of manufacture, and also for the waste that occurs during that process. Some little additional expense might have been involved in the proper preparation of this building for protecting the hundreds of souls which it was to house, but largely the changes necessary to avoid the most serious hazards now existing to both life and property could have been accomplished while the plans were being made and before construction had begun, with but little if any additional ultimate expense to the owners.

It seems, therefore, wise and proper that this great Convention should lay special emphasis upon the importance of architects having full knowledge of the hazard to life in the buildings which they plan or remodel, and also upon the importance of their determining with the utmost care the probable future uses of the building to be planned, and then, as far as possible, protect human life in the far as well as the near future.

Although this paper is not intended to go into the subject of building construction details, it seems right that a brief statement be made of some ways by which the life hazard through fire can be reduced most effectively. It is self-evident that where large numbers of people congregate, particularly in industrial establishments, theaters and hotels, fire-resistant construction should always be used; if for any reason that is not possible, the construction should at least be of a slow-burning type. The latter is usually as inexpensive to construct as the buildings put up without reference to fire loss. The method of escape for the people of the building should be worked out with much thought and care. Stairways should be located in such positions that they are reasonably accessible and not of a character to permit them to become direct flues for flames. The width of the stairways should be figured on the probable number of people who must escape therefrom in case of fire, and may be calculated readily from the space required by a person and the rate which he or she might reasonably be expected to travel safely in case of fire call.

Fire towers, sometimes prefixed with the adjective "Philadelphia," should be installed which would be adequate to empty the building in case of fire without the use of any other stairway.

Fire towers should be built of fire-resistant materials, with fire-resistant stairs, and should preferably be entered through platforms from the building proper. The doors to these platforms and the platforms themselves should be of fire-resistant material. The tower itself, of course, may be inside the building, but no doors whatever in the case under consideration should lead directly from the inside of the building to the tower. Thus, a person leaving the building through the tower first passes through the fire-resistant door to the platform attached to the outside of the building, passes along this outside platform to the door into the tower, and from there decends to the ground, where he makes a direct exit to the street. The swinging and attachments of the doors and the dimensions of doors, platforms, stairways, landings, etc., must all be calculated and designed with due regard to the extraordinary service they must perform.

Another type of tower which is not so fully efficient but which, if properly designed, gives fire protection, is one in which the doors on the various floors of the building enter directly to the tower from the building floor without the use of an intermediary outside platform. In this case there is great danger, unless the doors are built with exceeding care to make them tight and fire-resistant, and are so swung that they will automatically close off the fire tower and prevent it from becoming a draft chimney. This tower, therefore, is not so acceptable as the one first described.

Another effective and excellent protection is to divide a building or group of buildings with fireproof walls. The occupants of one section of the building are enabled to escape to adjacent sections by the medium of outside fireproof balconies similar to those used in the fire towers described above. In this case fire-resistant doors open upon the balcony on each side of the fire wall.

The old iron grill fire escape, of which there are tens of thousands erected in this country, has the ordinarily great weakness of hanging on the outside of a building where it is subject to flames shooting out of the windows alongside or below, and thus it becomes in itself a firetrap of the most vicious character. Some of the States of the Union have passed laws requiring that wireglass in window sash be used in windows near such escapes. This method of construction is a partial protection, but even with the best care to keep such windows closed and unbroken there is still serious danger to life from the cause named above.

Further, such fire escapes have usually at their bases either movable or swinging ladders for the first floor, which in time of fire are apt to cause trouble in their adjustment and thus result in the crowding of the people over the end of the lowest escape platform. It is thus usually inadvisable in constructing new buildings and reconstructing old ones to use even the best type of such fire escape.

Where such escapes, or indeed those of any other type, are in use great care should be exercised that they be at all times protected as far as possible from flames from nearby windows or doors, are in good working order, and have free, unobstructed paths for ingress and egress. Since proper attention to these details cannot be attended to after a fire starts, which may be at any hour of the day or night, a responsible inspector should be required to actually traverse the escapes from top to bottom and through all exits regularly and frequently in order that faults may be at once noted and corrected. This inspection should be in addition to that arising through fire drills. A like rigid and frequent inspection should, of course, be made of the local fire-fighting apparatus.

Belief in the value of the automatic sprinkler has been making great strides in this country. This belief is founded upon the excellent basis of experience. Where sprinklers have been installed properly they serve the purpose of inspiring confidence in the workers, thus making them less liable to panic, of putting out fires, of slowing the progress of fires, and of cooling the atmosphere where fires are in progress. The installation of sprinkler systems is a most excellent fire insurance obtained a low cost, and it is not unreasonable to insist that in all places where is serious fire hazard to numbers of human beings such apparatus stalled. It is well to emphasize as strongly as possible the high regard in which this department holds properly installed sprinkler systems and the wisdom of their installation in places where they can serve the purposes above named. The fact that insurance experts make exceptionally low insurance rates where sprinklers are installed is excellent testimony in their behalf.

With regard to the whole subject of the conservation of life by fire prevention, possibly there is no phase more important than that of the State and municipal organizations which operate in connection with owners and tenants of buildings.

In the view of the writer, regulations for the protection of buildings from fire should be drawn up by a board of State experts, such as is found now in the Department of Labor and Industry in Pennsylvania and in similar departments of other commonwealths. These regulations should be drawn up under more general enabling laws, passed by the State legislature. Preferably the department in which the experts named are employed should also have full powers of enforcing the regulations. This enforcement may readily take two forms—either that of a State board of inspectors connected with the State department, or by means of local municipal organizations which must report to and be responsible to the State department.

The latter method of organization is the most economical and desirable in many ways, inasmuch as local communities should each have organizations for both fire prevention and fire extinguishment. Most of our cities and towns now have departments for the latter purpose, but either by reason of the character of the State laws or other lack of responsibility they have seldom interested themselves in the important subject of fire prevention. There is no reason apparent why these local departments should not have full powers under the State laws to insist upon proper building construction, such as was touched upon earlier in this article, and other methods of fire prevention, including the prompt disposition of waste inflammable materials and the constant upkeep of individual fire-fighting and fire-escape arrangements and apparatus. Moreover, there seems no reason why these local departments should not be responsible to the State authorities for the efficient and thorough enforcement of the State laws and regulations bearing upon fire hazards.

The immediate reply to this suggestion will be that in this way all fire departments of the commonwealth will be placed under State control. There seems no valid objection to this kind of centralized control. The various fire departments can, as before, be appointed and paid by the local municipalities and be under their control practically as far as is now the case. The only State requirement in addition to the conditions at present frequently existing would be to place upon these local fire organizations the responsibilities called for in carrying out laws common to the whole State.

Both the State authorities, with such inspection officers as they may have, and the local departments, should make it their duty and business to obtain the sympathetic coöperation of owners and tenants of buildings in the work of obtaining and maintaining safe conditions. Without this hearty coöperation on the part of the people, which must be obtained by very tedious and carefully maintained educational methods, but a small fraction of the possible service can be rendered. It is a self-evident principle that public officials can accomplish but little good by enforcing the law unless they have the sympathetic backing of the great bulk of the people affected. With State and municipal departments working in harmony with owner and tenants, it seems possible to reduce death and injury through fire to a comparatively small amount.

It is not contended in any sense that the suggested organization is the only one which would effectively accomplish the aims desired, as doubtless there are many other methods of State and municipal coöperation which might prove equally effective. However, it seems that this large gathering is in itself an indication that some such public organization and coöperation as indicated will rapidly spread over this country and will, within a reasonably short time, materially reduce our present harrowing *loss of life through unnecessary holocausts.*

Mr. Evans: I will interject here the fact that at the last meeting of the Pennsylvania Legislature the Philadelphia Bureau of Building Inspection through its counsel, Mr. Rowland Evans, offered a bill to withdraw the requirement that fire escapes are obligatory for three-story buildings used for more than one tenancy. Is that correct, Mr. Clark?

Mr. Clark: No; the bill demanded that fire escapes should not be required for buildings of three stories, in the heart of the city, in which there were not more than five rooms and bath to each floor.

Mr. Evans: That is mandatory, I understand?

Mr. Clark: Yes.

Mr. Evans: Mr. Rowland Evans told me (as Chairman of the Fire Prevention Commission I was opposed to the destruction of that measure) that in principle he agreed with me but in practice he did not. Here is a law broken on 50,000 buildings, every one of which needs protection. In a city of this size, made up of nearly 400,000 buildings now, a large proportion falling under this class, the necessity for fire escapes is appalling, and the scope of this preventive work is very wide. It is important, especially in offices, to impress upon the people the necessity of preventing fires; and on the other hand if the best escapes are required in all buildings their cost is prohibitive; and just how to balance the matter is one of the hardest problems in this whole matter of fire prevention.

We have now covered the section of this topic devoted particularly to the life hazard. Following it comes a paper on building construction proper, and somewhat more in detail. Will you comment now on the life hazard? I will call attention to the fact that we are getting along in time, as we started a little late this morning. If there is no objection we will proceed with the next paper, which I will also read in the enforced absence of its author, Mr. Miller.

"BUILDING CONSTRUCTION—PROPERTY HAZARD"

By Mr. Rudolph P. Miller, Superintendent Bureau of Buildings of the Borough of Manhattan, New York

No self-respecting architect or engineer, in preparing plans and specifications, would consider that he had served his client properly if he had not applied the fundamental principles of mechanics to secure a structurally safe building. The same can hardly be said of most architects and engineers in the matter of fire protection. And yet, quite as important as the structural safety of a building is its safety against the ravages of fire and the protection afforded its inmates in case of fire.

To secure these consideration must be given to the following points:

1. The use of incombustible materials to reduce to the greatest possible extent the food for fire.
2. The application of efficient fireproofing to protect such structural parts as would suffer by exposure to intense heat.
3. The suitable disposition of structural parts to guard against the spread of fire.
4. The application of devices and forms of construction to afford protection against fire from the outside.
5. The installation of sufficient apparatus to fight and quench fires; and
6. By no means least—the provision of safe and adequate means of egress for the inmates.

Time will hardly permit as thorough discussion of these points as they merit, but an attempt will be made to present the more important conclusions from their consideration.

It seems almost trite to say that occupancy would largely influence the conclusions to be drawn on these points in any particular case, but it is believed that careful attention to these matters will practically eliminate the hazard of the building and confine the dangers to the occupancy.

Economic consideration, too, will govern the use of materials and the manner of construction. But cost is too often made an excuse for poor and unsafe construction, resulting in false economy.

Wood should be used for outside wall construction only in the case of detached buildings, and even then only for residence buildings of less than three families, with possibly stable and outhouses in connection with detached dwellings included. Even in suburban districts, although the dwellings may be detached, there is little or no excuse for frame walls, since terra-cotta, concrete blocks and stucco have been so succssfully developed for that purpose.

For interior construction timber is still largely employed, but its abandonment should be urged in all buildings used for public and commercial purposes, no matter where or how located—it being understood that "public," as here used, applies to all buildings used as hotels, churches, places of assembly, and institutions of all kinds, as well as courthouses, town halls, etc.; and "commercial" to buildings used for business, manufacturing and storage purposes.

In larger cities limits should be fixed within which the use of combustible materials for structural elements of buildings shall be entirely prohibited, the included area being the districts where a small fire is liable to start a conflagration.

Where buildings exceed certain limits of height or area, no combustible materials should be used. A discussion of what these limits should be is given in a paper by Prof. Ira H. Woolson, of the National Board of Fire Underwriters, in the Transactions of the American Society of Mechanical Engineers for 1913.

The distinction between incombustible and fireproof (fire-resistant) materials must be carefully made. Incombustible materials will not burn, but incombustible materials are not necessarily fireproof. A steel column is incombustible, but unless this column is properly fireproofed, a yellow pine post of equal strength would be much safer in a fire.

The essential points in fire-resistant construction are that the structural elements shall be of incombustible materials, and unless these materials are in themselves fire-resistant, that they be encased with fire-resistant materials. No substances must be taken as fire-resistant that have not successfully withstood tests to demonstrate their fire-resisting qualities, such as are outlined in the standards of the American Society for Testing Materials, and given in the Year Book of that Society.

Even more important than the use of incombustible and fire-resistant materials is the design or planning of the building. The reason mill construction has been so successful from the fire insurance standpoint is that careful attention was given to the details of the design. Briefly, the main points to be considered are the following: All floors should be solid, that is, unpierced, so that fire may not spread from floor to floor. A fire is recalled in a fire-resistant building in New York City where more damage was done two stories above the one in which the fire occurred than in that story, because openings were left in the floors where the heating pipes passed up through the building. The necessary communication from floor to floor should be provided in sections distinct from the main building and separated by walls of the same construction as the outside walls. Interior walls of construction equal to the outside walls should divide the building into sections to confine possible fires to limited areas, their frequency depending on the character of the occupancy. All walls, exterior or interior, should be carried above the roof 3 feet or more. All openings in the interior walls for communication from one part of the building to another should be limited in size and provided with doors in accordance with the standards fixed by the National Board of Fire Underwriters. Only tried materials of sufficient thickness should be used for the walls, not only to safely sustain the imposed loads but also to effectually resist the attack of fire and flame; and if bearing walls are used, terra-cotta tile or concrete blocks should be avoided except for detached residences of limited height. Cornices, where necessary, should be of incombustible materials and backed up by masonry for their full length and height. Above all, concealed spaces, pockets, cocklofts, etc., should be eliminated from the plan.

Unless a building stands entirely isolated the hazard from outside sources requires as careful consideration as the interior risk. The walls of a building, therefore, serve the double purpose of protection against both these hazards. This protection is not complete unless the walls are solid and without windows or other openings. When these latter exist, some form of protection must be provided. This may be afforded by (1) fire shutters, either tinclad wood or steel; (2) metal windows glazed with wireglass; or, (3) water curtains. Perhaps the most effective of these is still the tinclad wood shutter, because not only does it shut out fire for a time generally sufficient to get it under control, but practically no heat is transmitted. The steel shutter is perhaps more sightly, and when well constructed is effective; but the heat transmission is considerable. In this latter respect the fire window (metal frame and wireglass), because of its high radiation, is least desirable; but it has certain very decided advantages in that it is more likely to be closed when the building is unoccupied and is easily made automatic in its action, so that even if left open it can be made to serve its purpose. Too little is known of the efficiency of water curtains to recommend their use. In all cases of window protection, the standards of the National Board of Fire Underwriters should be carefully followed in order that satisfactory protection may be afforded.

Only a brief reference can here be made to fire-extinguishing apparatus. The conditions of installation will be treated in other papers to be presented. Depending on the character and occupancy of the building, it should be provided with fire buckets at convenient points, hand chemical extinguishers, standpipes, with not only standard hose attached but also a small hand hose for use by inexperienced persons when a fire is still in its incipiency, fire pumps, and—most effective of all—automatic sprinklers.

So, too, only a mention is made of the means of egress. The old-style outside fire escapes should be avoided, even though they be provided at the lowest landing with satisfactory balanced ladders. They are dangerous and unsafe, because smoke and flame issuing from windows at which they are placed are likely to envelop them. In wintry weather they are apt to be covered with sleet and ice, and they do not allow as quick and ready escape, and those expected to use them are not accustomed to them. Outside stairs, when protected by shields or otherwise from window openings, are a decided improvement. The real protection however, should be provided within the building itself by adequate stairs, placed within well-constructed fire-resistant enclosures or in fire towers accessible only by outside balconies, or by substantial fire walls properly equipped with fire doors.

MR. EVANS: I have been requested to ask Mr. Porter in what way he could apply the theory of the bisectional wall to theaters or places of public assemblage.

STATE OF NEW JERSEY
DEPARTMENT OF LABOR

NEW BUILDINGS

Under the fire-protection law the plans for all new factory buildings or alterations to old buildings to be used for factory purposes, must be approved by the Commissioner of Labor before erection, and the law specifies that building two stories in height shall have at least two means of egress from each floor, which may be inside stairways, outside fire-escapes, or both, and that all buildings more than two stories in height shall have at least two means of egress, one of which must be an outside fire-escape, or an approved tower. The number of egresses must be increased as the circumstances warrant.

FIRE TOWERS

The Department especially encourages the use of fire, or stair towers, in preference to outside fire-escapes on new buildings. It will accept a suitable construction of fireproof stairs and landings, enclosed in walls of fireproof material with approved fire doors at the entrances, or a tower completely enclosed with fireproof walls and having outside entrances (which are made in accordance with drawings issued by The New York Board of Fire Underwriters).

Where the type of tower with outside entrances is followed, the Department will not insist in all cases upon an absolutely fireproof construction of the interior platforms and stairways. The doors leading to platforms and to the tower must be of fireproof construction.

It is the desire of the Department to encourage a uniform use of the fire tower with outside entrances, and we shall be very glad to have the architects of the State coöperate with us in this matter, as they have done with our previous requests.

FIRE-ESCAPES

The Department has prepared drawings of the straight-run type of fire-escape including the cantilever stairway to connect the lower balcony with the ground, and also drawings of two other types of escapes which make excellent methods of egress under some conditions. Blue-prints showing working details of these escapes will be furnished upon request.

FIREPROOF DOORS AND WINDOWS

The fire-protection law specifies that entrances to all fire-escapes must be made by means of doors cut down to the level of the floor unless some other method is designated by the Commissioner of Labor. These doors, together with all doors and windows opening onto or directly under fire-escapes, shall be metal covered and all glass used therein shall be wireglass.

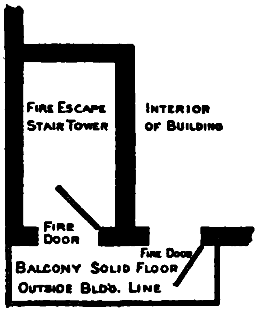
The specifications of the Department of Labor for these fireproof doors and windows have been issued and working details of same will be loaned upon request. If any other character of construction is desired it should be submitted to the Department for approval.

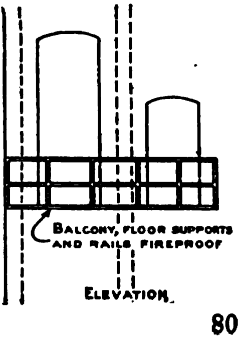
I would greatly appreciate an expression from you of your personal opinion of these questions, and want to again assure you of our endeavors to assist you in every way possible.

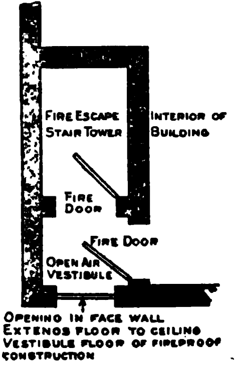
Yours respectfully,

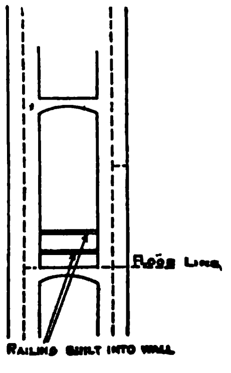
LEWIS T. BRYANT
Commissioner of Labor

NOTE.—Sketch plans below illustrate above requirements.

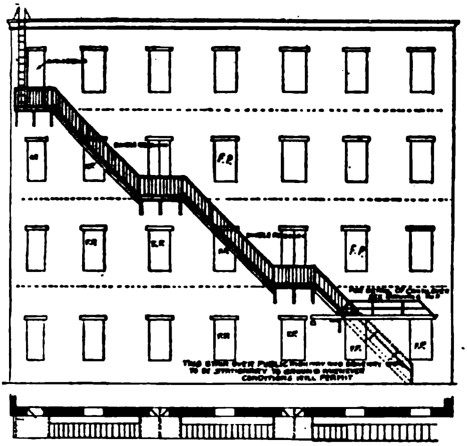


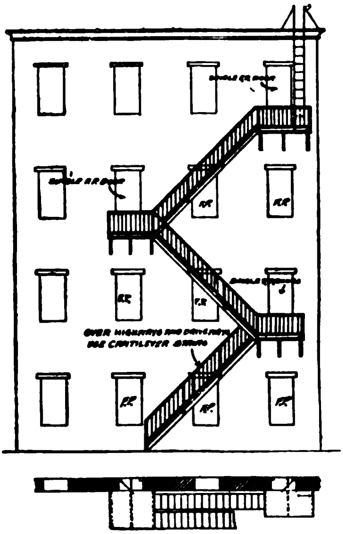


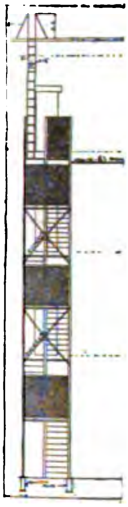


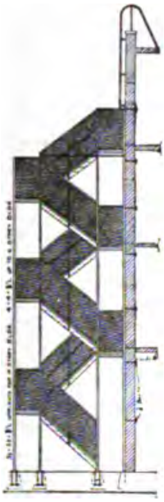


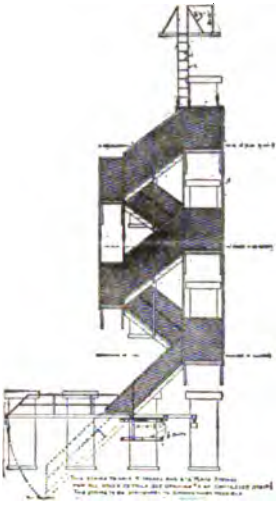
SKETCH PLANS ILLUSTRATING NEW JERSEY REGULATIONS

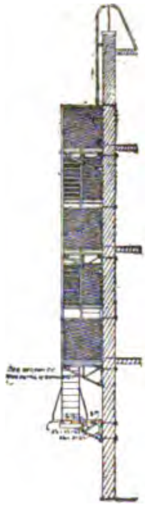

F.R.
This stair over public highway and sidewalk to be stationary to ground whenever conditions will permit

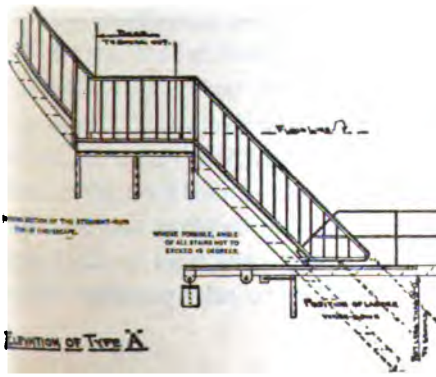


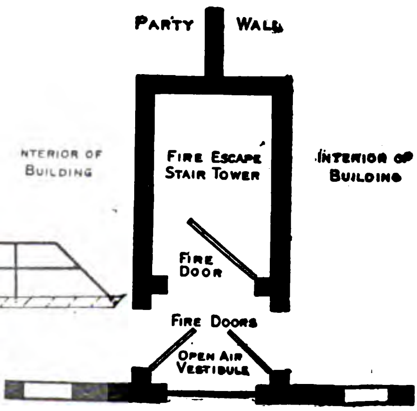









Where possible, angle of all stairs not to exceed 45 degrees.
Position of ladder when down
Elevation of Type A



Mr. Porter: I think it would take a diagram to describe that. I have a lantern slide I will show on Friday evening giving a diagram of a theater which illustrates the method of applying the fire wall to make that type of building safe. Of course, it requires changing the plan of the building—eliminating the longitudinal aisle and having the transverse aisle approached from courts on the side.

Mr. Robert D. Kohn (New York): Mr. Porter's admirable paper has called attention to this most valuable feature of the bisecting wall. I should like to ask him, or rather I should like to criticise his description of that wall in one way: if it is for life-saving purposes why call it a "fire wall"? Why not call it, as in New York, the "fire-division partition"? This is a wall that divides an area occupied by a great number of people, giving a safe exit to another area separated from the first. Why require it to be 12 inches or 16 inches thick or have fire doors on each side of the wall? Why not try to encourage for this valuable life-protective purpose a type of partition thinner—say, 6 inches thick, with metal doors automatically closing, if you please—doors in common use?

Mr. Porter said it was difficult to have people give up their space for fire towers and that therefore the fire wall is the best means of safety. Why not make that means as simple as possible? What you are trying to accomplish is to keep smoke and flame out for a reasonable length of time. You do not expect people to stay in there two or three hours and let the fire rage downstairs; but you will try to get them out, and you are going to give them an area of refuge. Why not do that in a way that the owners will see is reasonably cheap and does not block off their area? I can see a scheme of that type almost entirely of wireglass. Suppose it does fall after ten minutes? It would have accomplished its purpose. Otherwise, I think Mr. Porter's paper is so admirable that even this criticism seems almost superfluous.

Mr. Evans: You have had a point of view from a man not only an architect but in the heart of this fire-prevention movement, and we want to get other views of these proposals like that, which may be the basis of some constructive legislation in different parts of the country.

Mr. Guerin: I would like to speak of the fire wall. I am very much interested in it. I don't quite agree with Mr. Kohn as to the protection of that wireglass wall. I don't think 10 or 15 or 20 minutes long enough. I can refer you to a candy factory building ten or twelve stories in height, in New York City, covering more than a block each way, containing enough material in the cellars to take possibly 500 or

600 firemen with their complements of apparatus anywhere from 6 to 10 hours to get in control, even with sprinkler equipment in operation.

I know it is possible for fire in that cellar to burn an hour without the people on the third or fourth floors knowing of it at all, perhaps longer; and anything that would not stand up well ought not to be considered in the fire wall proposition (particularly where the heat is great), in relation to the people who occupy it. Take, for instance, one terrible disaster in which the fire was raging all over one floor and people upstairs didn't know anything about it. A girl wrote on the telautograph: "This building is on fire. Fly!" The people upstairs thought she was joking.

Yet I don't agree with Mr. Porter entirely on his theory of the fire partition. I will say it is an advance, a considerable advance, and a great benefit; but we ought to get the best thing of its kind, I think. To give an illustration of what I mean by this: Several years ago when the tenement-house law was first considered there were two kinds of wall —one from the street to the roof of the building and the other was a party wall. After much discussion with old Chief Bonner (who is perhaps as good a man in that line as we have had for many a year) and several Assistant Chiefs of the New York Department, the conclusion was reached that no balcony fire escape would be accepted where there was a break in the fire wall. There isn't any question that a fire wall with breaks is better than no fire wall at all; but to show you the value of fire walls with breaks in them, I will give two illustrations: One is the Haywood chair factory fire on Cherry street, New York, some years ago. There were two buildings, each having a main partition wall, and each 20 inches thick, giving almost 40 inches of brickwork for the fire to go through; but they had divisions with fire doors—splendid doors, too. When the alarm showed the fire was on the second floor of the west hall, every hose line was sent into the east hall building through the fire doors. It was important to get through because of the smoke and heat from the doors. As a matter of fact, both buildings were destroyed. In the second illustration I will not mention the name of the factory. I visited a building used for factory purposes covering almost a square block in which there were 800 women employed. If a fire started there were not less than 12-inch walls separating them. On various floors, particularly in the cellar, I found the elevator shaft door a self-closing door held open with a fusible link attachment. The elevator man had run a car of goods to go up the elevator. I said to myself, "I will see how long the car stays there." It stood there perhaps half an hour or more. I went poking around the other doors. I found them held open with fusible links and boxes stored right in the opening. I asked the man to release the doors to see if they would operate, and some would not.

I feel I have committed myself to this position: that where a fire wall is a necessity it should be right; not with weaknesses, and not depending on the human element that fails ninety-five times out of a hundred. But let us get this proposition, and it is not in my opinion impossible. Let us divide the building solidly and get access to it by means of balconies on the exterior. Some will say the conditions of factory life are such, because of the necessity of carrying material back and forth from one area to another, that it will not operate properly. I believe balconies could be so divided that the traffic from one area to another could go around the fire wall, and we would have the full benefit of the fire wall without these weaknesses. I don't say it is not an advance as it is, but when we are taking such a step, let us take it fully right.

PROFESSOR IRA H. WOOLSON (New York): In the case Mr. Guerin has just cited of the fire in the two warehouses, in which the fire passed from one building to another through the fire doors, were the doors closed, or open because not operative, or were they opened by the firemen in attempting to fight the fire through them?

MR. GUERIN: The men never got through the fire doors. They could not get through them. They never opened the doors; they could not because of the fire and smoke.

PROFESSOR WOOLSON: Was it the heat and smoke that passed around the edges of the double fire doors?

MR. GUERIN: That is the only way it could be accounted for. It filtered through the crevices in the fire doors.

PROFESSOR WOOLSON: Rather a remarkable statement, and it contradicts the general idea of the efficiency of the fire doors.

MR. GUERIN: I will not vouch for the doors on the upper floors. Only the doors the men attempted to get through on the second floor. They never got through the second floor of the building. The upper doors might have been open and allowed the heat and smoke to come down. Still, we must admit that the weakness is there—the pierced wall was the weakness which the fire door could not cover.

PROFESSOR WOOLSON: As I say, it is contrary to the generally accepted belief in the virtue of the fire door and contrary to my own experience with it, and quite a contrast to that experience. I know of a case of fire doors in a warehouse (which burned a couple of years ago in Newark) which had only single doors on one side; that is, fire doors on the inside of the wall only; and although the doors were of good quality they were not standard fire doors; that is, did not have the standard amount of lap, which was two inches instead of four inches. These doors were exposed to terrific fire on the opposite side from a non-fireproof building stored with furniture and closely packed around these doors within a very short distance—18 inches of the crack in the door. Alongside the door was very highly combustible material, yet the fire was kept out of the second building for one hour by the fire doors. It did eventually get in, but that was because those doors were not watched as they should have been by the firemen. They had confidence the doors would hold the fire and they went away. In the course of time the heat coming through did ignite some paper and set fire to the rest of the building. It seems remarkable that the fire should go through the fire door on one side of the building, 20 to 40 inches thick, and go back so effectively.

Mr. Guerin: I will ask the Professor to remember I didn't say that the doors on the upper floor were not open. I don't guarantee that. I am not criticising the fire doors. No one knows better than I do their value. I don't criticise the integrity of the doors, but I do say that the fire wall with holes in it is not a full protection to life and property.

Professor Woolson: I can't subscribe to Chief Guerin's theories in regard to the application of the fire wall. Neither do I think he entirely understood the idea (if I understood it correctly) that Mr. Kohn was trying to explain. I think there is a wide difference in the function of the two types of partitions which we are discussing. The fire wall is one thing and the fire exit partition (division partition) is another. I thoroughly believe in the efficacy of a moderately thin fire division or fire-exit partition in places where the fire wall would be either unnecessary or an unreasonable requirement for the protection of the building from the spread of fire through the whole building. I believe fire walls necessary in certain prescribed limits. Those areas may be comparatively large, and the number of people employed in such an area might be too great to escape by the elevators or stairways provided. In that case the areas could be subdivided by a partition which would hold the fire; not for ten minutes but four or five times that—an hour, if you please. The cost would certainly be moderate—a very small fraction of the cost of a fire wall—and have very many less objections to it. I mean a partition of terra-cotta or metal studding and lath 3 inches thick which would hold a fire certainly for an hour. I have seen it demonstrated again and again. I have seen a partition under test for twelve hours and still in comparatively splendid condition.

Now, a partition of that kind would occupy very little space. Your wireglass windows could be installed for observation anywhere (by the superintendent) over the floors. It could have swinging doors of the self-closing type and it would be a life-saver and a moderate saver of property at the same time, and it would allow the firemen to get in and fight the fire through these openings. As to the fire wall, my conception is: divide the large floor spaces up into certain units which would be not only absolute protection against fire but also against loss of life. I am in hearty sympathy with the feeling, measurably, that I presume the gentlemen of the architectural fraternity here have. We are all hammering them, and they surely will defend themselves. But it is only loading up a willing worker with the responsibilities that others ought to bear; that is, the architect is the medium through whom we get at the owner, whose ignorance or taste he has to deal with.

The evidence we are piling up in these matters is cumulative and comes from the viewpoints of men dealing with this problem from many phases, and we hope this total record of all these topics will carry conviction in different sections of the country to the legislators and officials whose duty it is to define legal requirements providing these means of safety.

Mr. Porter: Just in closing, may I have a few words? The discussion following my paper I think has covered it very thoroughly, with the various criticisms made upon it. This whole subject of fire walls for the protection of life is a new one, and it is thrown into the arena for the purpose of discussion, and to make a better method of saving life. We will have better fire walls and fire doors, and legislation to make them more effective. It is in the direction of advance, I feel that the inadequacy of the stairway must be impressed more. That is why we must have these fire walls substantial and the fire doors such that the fire will not get through.

When you get the people through the wall they must be safe, because where we have many people on a floor and have only stairways or elevators to get them to the ground, we must be sure that the crowd can get down. We must have adequate means for those people getting to safety, and we must make that fire wall so safe that they can stay there some time in order to effect their escape. Buildings 10 to 12 stories high, and having from three to four hundred people on a floor, are unsafe at present. They cannot get down the stairs and must have a place of safety in which they can stay for some time. I don't know how many have tried to come down ten or twelve flights of stairs, but in the cases of those trying to get down some have heart trouble, some lung trouble, others have hernia, and they soon become fatigued and sit down on the stairs. They must be helped down or climbed over.

Mr. Clark: I would like to ask Mr. Porter one question. In case some people are overcome by smoke, or burned, who is to close the door after they have passed?

Mr. Porter: Well, the door should be self-closing, of course; but there should always be an accompanying arrangement in a crowded room by which it would be the permanent duty of someone or more individuals to see that that door is closed. The exit test which I advocate should include the appointment of someone to the duty of seeing that the doors are closed when the people are through.

Professor Woolson: One point I would question, too. My judgment is that where there is a fire wall used as an exit—that is, the opening through the wall is used as an exit—the doors should be of the self-closing type. The man whose business it is to close the doors may be absent, but if one is an *automatic* door operated by heat, and the other a *self-closing* door, then the opening is always closed to the spread of smoke and fire.

Mr. George H. Holt (Chicago): If you have fire doors you will need a fire drill to prevent panic and the blocking of the doors, and must designate some one who will close the doors when they are all through them.

Mr. Porter: There should be no necessity for panic in any instance, for where we have a fire wall the confidence of the people is so established that there is less likelihood of a panic. A fire door of moderate size will allow at least two people to pass through abreast; fifty people could pass through in 25 seconds, so that the people, in case of a fire alarm, will simply get up and go through the doors without undue excitement at all. The fire wall, I think, is as good a preventive of panic as we have.

Mr. Ballinger: I want to say a word for the fire escape. It occurs to me that if we have a fire wall the opening may be the spot in which the fire originates, so that the people will not run toward the fire to get away but run in the opposite direction to the stairway. So it is necessary for the stairway to be smoke-proof. The fire escapes in present use are of two types, with modifications. One has the outside balcony and the other an inside balcony or vestibule. Either requires the occupants to go outside in order to get into the tower but once in the tower they can walk down stairs without danger of fire reaching them. I appreciate what Mr. Porter says about the exhaustion attendant on coming down from a high building, but it would be possible to come down underneath the fire and seek means of escape there. The tower fire escape is, I think, the best means of escape. After going through the fire wall it is unnecessary for people to get down.

MR. EVANS: Any other discussion, gentlemen?

MR. PORTER: I would not depreciate the value of the smoke-proof tower when used in connection with the fire wall. When in the tower people are safe, but if not in the tower what would happen to the people who are not in? The inadequacy of the tower is what we are criticising.

MR. C. M. GODDARD (Boston): With reference to Mr. Forster's remarks about the ordinary exterior fire escape, we should be careful that it does not lead the public to infer that we believe that that form of fire escape, even with wireglass windows for protection, is one which we recommend when considering safety to life rather than safety to property. We were told yesterday that even the Supreme Court needed education and instruction from the common people to enable them to render a verdict which would stand the test of time. Now we are speaking here as a jury, or as a court. I believe it is frequently the custom of juries and courts to view the premises; and I believe if this jury would go with me on a short journey (I would have to take you out of the city because I arrived after dark and do not know whether the premises are situated here or not), we could learn from the common people as to the value of the ordinary exterior balcony fire escape. If you will go with me to the city of New York, and then a little farther—to the Grand Central Depot—and take a short ride on the railroad, I think I could prove to you that the common people have come to the unanimous conclusion that the exterior fire escape is a very valuable adjunct to their buildings for the storage of feather beds, ice chests, bed clothing, for use as sleeping porches, etc.; and they have come to the conclusion that that exterior fire escape is so valueless to save their lives that they don't hesitate to keep it so obstructed that it certainly would be valueless. And I believe the common people are right, and this Convention—this jury—should render a verdict in accord with the opinion and desires of the common people, relegating absolutely that exterior fire escape, no matter how it could be improved and protected, to the end of increasing the floor area of their property for storage and other purposes.

MR. WM. MCDEVITT (Philadelphia): I agree. I have had a good deal of experience as to the outside fire escape. I don't think this Convention should even commend them. A great deal of reliance is placed on them through drills. They should not be discouraged, but have you ever witnessed a drill—say, a very successful drill, with a watch in your hand? Watch the females smiling and waiting to take their places on the stairways, and then go up into the building on the various floors and see the girls waiting there. What if a fire should occur in that room? There is no fire escape adequate to permit those people to make their escape. I believe the only fire escape is from one building to another over a horizontal plane.

Mr. Paul Mason (Kentucky): I want to call your attention to the remark of Mr. Ballinger in which he said of employees or others escaping from one floor and in danger of exhaustion going down the fire escape or any stairway, that if they could find access to a lower floor, below the fire, they would be safe—provided, of course, a horizontal fire wall intervened. I would call your attention to the fact that there is not a fire drill in the country which provides for ingress below the fire. We had an example of that during the Fire Marshals' Convention last week. We were taken through the plant of the Curtis Publishing Company and they turned in an alarm from one of the upper floors, with all of us on the top. During the drill, on the way down, one of us got caught in one of the outside fire escapes, and was not permitted to enter the building below the supposed fire but had to go all the way to the bottom. And unless that building, in my judgment, were provided with sufficient exits from one section to another, so that all employees might be taken across, no matter where the fire originates, any plan contemplating entrance below the fire would result in loss of life and of property also.

Mr. Clark: I would state relative to the Curtis building that you can enter any story from the vestibule door.

Mr. Mason: But we were not allowed to do so.

Mr. Clark: But that is the method intended—that you can enter any story. We may have horizontal division walls in the form of floors, if there is no division in the walls, just as adequate as the vertical division walls. You can go to a lower story and be perfectly safe, with horizontal walls in the form of floors.

Mr. Evans: We have now passed our schedule time, and if you feel that adequate discussion and different points of view have been recorded here in respect to this subject I will read to you again for final action the tentative resolution. If I may be permitted to suggest, this resolution should have added to it a somewhat more explicit expression of view with respect to fire escapes, and I have added to this formal verbiage an additional clause which will make it read as follows: (Reads resolution announced, adding "Outside fire escapes should be properly suppressed").

MR. PORTER: I would suggest, in regard to "specification construction and appliances," taking into consideration Mr. Forster's suggestion, that sprinklers are life-savers.

MR. EVANS: As I understand it, then, you would add after construction the word "appliances"?

MR. PORTER: If not going too far I would insert that a building should have an exit test to apply to it.

MR. EVANS: The question to my mind, Mr. Porter, is that we would be incorporating in our rules for building construction a requirement as to management which would come at a different point in our program.

MR. PORTER: I do not see that it is management, but the appliances could be submitted to the building department and they could develop a test to determine whether the building is safe for occupancy.

MR. EVANS: You would add "In accord with adequate exit test"?

MR. PORTER: Yes.

MR. EVANS: It is certainly a desirable way to assure that your plan is workable.

MR. PORTER: Any man who orders a mechanism from a manufacturer will not pay for it until he sees that it will work. But we are in the habit of ordering plans from the architect and never expecting a test as to practicability.

MR. HOLT: You have added a very radical change to this resolution. It would appear that the discussion has been so comprehensive that you are prepared to add a suggested clause in relation to the suppression of existing fire escapes in which hundreds of thousands of dollars are invested all over the country, existing by ordinance and still believed in by the people. If, in accordance with Mr. Porter's suggestion, sprinklers and fire walls are added, why take down the fire escapes already there. I doubt whether the Convention should go on record that all these existing means of escape should be taken down.

MR. EVANS: Mr. Holt, expressing now merely an individual thought, I take it that many of us here have for some years been saturated measurably with certain points of view and certain conclusions; and my own conclusion leads to the following result: that in theory, from all the evidence procurable up to the time when I was brought into the active management of the proposal of safety to life in this city, the outside fire escape in its usual form was not only impractical on the average when called upon to perform its duty, but it introduced a moral objection in that people were relying on a "broken reed" which failed them when they tried to bring that reliance into practical employment. And as to the proposition to-day, I am willing to go squarely on record as advocating that the common outside fire escape be wiped out with respect to use for saving life. I would go down a water gutter or electric wire, but I would not want to rely on an open-grate escape such as you will find in the average city. And it is often a question as to whether you should not carry a rope in your pocket or not go into the building. I think the aggregate of that point of view and that expression is what has been brought up in this analysis here.

Mr. Holt: I do not want to differ with the Chairman; but of the principal life-saving appliances discussed here it seems to have been agreed that the automatic sprinkler is one practical appliance and that the other is a connection between buildings in congested districts and running horizontally. The suggestion that the public lacked familiarity with the advantages of the sprinkler as a life-saver brings up the condition that I suggested to Mr. Porter in reference to the panic at his doors in the fire wall, viz: that with the proper sprinkler protection in that room there would be no panic—no necessity for fire doors or fire walls. But if there is no sprinkler, you would be building a furnace; and these papers, I believe, were entirely along that line. To build a structure that would keep out fire would be to build one that would keep in fire and the people living in it would be subjected to that danger. These resolutions, I presume, are intended to be workable and in accord with the sentiment of the people who have to put up the money.

Mr. Evans: I do not see how the propositions are conflicting, Mr. Holt. A man can put in a sprinkler system or not, as he chooses; but that does not mean he should not have some means of escape, and this proposed resolution is on the character of the escape; and our Convention here is to give our best general view as to the line of action producing the best results in future in this respect.

Mr. Cole: What are you going to do with the three-story and four-story city dwelling? Nothing is here suggested for the people on the top floor.

Mr. Evans: The purport of this addition would be that an adequate means of escape should be provided. Now the determination of what is adequate, of course, must go to those having jurisdiction; but the gist of it is that the open fire escape is not adequate and should be replaced and suppressed. When you are going to do it, and how, must be left for legislation.

Mr. Cole: Isn't it the only thing now for the three- and four-story building? Not adequate, perhaps, but the best we have? We recently had two people burned in Boston, and if one of those fire escapes had been provided these fatalities would not have occurred.

Mr. Evans: This would call for the opinion that adequate escapes should be provided, but we merely say that the old form is inadequate and not the proper form.

Mr. Cole: I am in favor of this escape where it is the only thing possible.

Mr. Evans: That would be, in your case, for Boston to decide. We only express the view, from experience, that they are not adequate —from historical experience.

Mr. Cole: Wouldn't it be better to refer it to future consideration rather than say they should be suppressed and taken off the buildings in many cities throughout the country? If you do that, you would do away with the only means of escape.

Mr. Evans: That is our purpose here, to gradually force that issue and see that the buildings needing protection will get it, and not assume a protection which does not really exist.

Mr. Guerin: Wouldn't it at least be well for the Convention to express this in the resolution—if not to go as far as you have expressed it—to go on record that the outside fire escape is the least desirable form of escape? Let us get it on the record, and educate the people up to it.

Mr. Evans: And add, "and should be gradually replaced"?

Mr. Guerin: Yes.

Mr. Evans: Would it meet with your thought, Mr. Cole and Mr. Holt?

Mr. Holt: Will you read that as it now stands?

Mr. Evans: "All buildings should be required by law to be equipped with adequate fire exits and escapes proportioned to their respective human occupancies in accord with an adequate exit test. Outside skeleton fire escapes are deemed the least desirable form and should be gradually replaced."

Mr. Holt: It seems to me you are making a very general and inclusive statement. I agree with the gentleman from Boston. There are many places where they are entirely desirable and I would be glad to see them.

Mr. Evans: We have merely differentiated, Mr. Holt, as to physical means of doing certain things.

Mr. Barstow: I think that in the proposed form we have at least expressed our position mildly enough. It seems to me commendable for this reason. In Boston, New York, and some of the more inland cities, you will find a few of the public will voluntarily provide adequate exits and escapes and where the fire marshal permits the ordinary skeleton fire escape to be put on buildings, that is considered the easy way out and done. The owners have done that, and said they have protected the building. In Rochester there are many buildings having open elevator shafts and open stairways. I think the Chairman's position in the matter should be sustained.

MR. HOLT: The first part of the resolution calls for "adequate means." The common outside fire escape, of course would not be adequate even if the chief of the fire department (possibly interested in the manufacture of outside fire escapes) should say so. But there are many places in which the outside fire escapes are an adequate means, and you have seen it used successfully at times, and so have I. There is no better way in many cases. I would say "undesirable," and not eliminate it. I believe that with the fourteen-story building the outside fire escape is an inadequacy.

MR. EVANS: I merely want to get the consensus of opinion, but our time is going and if you will permit me to read these comments again, we may agree on our verbiage.

MR. VIRGIL G. MARANI (Cleveland): If this Association has any data showing the number of lives saved on outside fire escapes and the number of lives lost, and if investigation shows that the lives lost were in excess of those saved, we should certainly condemn the outside fire escape.

MR. EVANS: We have not been organized long enough here to have conclusive proof about anything, but we have had frequent disastrous failures. There are many cases where people try to get down them, and many are saved; but the question is why should not enough money be spent to save a larger proportion?

MR. MARANI: But that same proportion could be applied to other means, as elevators, etc.

MR. EVANS: This does not eliminate anything, but merely says that the outside fire escape is the "least desirable" form.

MR. MARANI: I am speaking of old buildings.

MR. EVANS: I think old buildings should be forced to reconstruct. I think the time has come where we should be forced to face that question as men and not children.

MR. MARANI: But from the legal standpoint of destroying life.

MR. EVANS: We found that question in this State—the question of forced retroactive improvement of property. It simply requires reasonable recognition of existing dangers to compel us to go ahead and do some reconstruction work. We have played too long. Property conditions as now existing cost too much life and these conditions must be bettered—that is the propaganda.

Mr. Marani: Do you not think that the conditions proposed in remodeling are not met half way? The owner of the building will use any subterfuge, if it means remodeling of the entire building; whereas, if not so severe, he will endeavor to meet the requirements.

Mr. Evans: We find here that if a man is told to put a ten-cent tin bucket in his place he will at times show a disposition to go to law.

Mr. Marani: Illustrating, for instance, in Ohio (not so much with this city), we have the impossible condition of a recent enactment—I was commissioner in Cleveland trying to enforce the law—calling for fire escapes on old buildings not having means of escape, where there was no enclosed courtway giving exit into the street and on the other side no exit except through private property; and in these buildings we found no back yards and the only place for the fire escape was in the front of the building on the street.

Mr. Evans: But this resolution simply applies to reasonable practice. I am afraid we cannot go into it farther for debate. I believe if the mover of that amendment will withdraw it (the discussion which has been brought out will appear in the Record) that the strong condemnation of the outside fire escape will be stronger than any verdict we could put in. I believe that the amendment might be withdrawn and that the expression of opinion given on this floor will be all that is needed.

Mr. Guerin: I respectfully ask that the amendment stand, because the discussion was participated in only by a few of the members, and I ask the Chairman to present the full amendment, in which is included the discouragement of this form of fire escape, with the "discouragement" strongly emphasized.

Mr. Barstow: Could this be referred back to the Committee?

Mr. Evans: There is no committee. We must act summarily here on all affairs.

Mr. Barstow: In Boston some form of escape should be required for the three-story dwelling.

Mr. Evans: We are not forcing it in detail on any place but simply emphasizing that the skeleton escape should be discouraged.

Mr. Troth: Does not the last line take that in?

Mr. Evans: It is such a big subject that you might do all the resolution calls for and not get adequate emphasis. The resolution would read as follows: (Reads.)

Are there any more comments? If not what action shall we take?

On motion of Mr. Guerin, seconded by Mr. Porter, the resolution was unanimously carried.

Resolution Adopted on Topic 3

"It is the sense of the Convention that:-

All building construction and reconstruction—having in view the present and near prospective congestion of its location and the range of occupancy proposed—should fully include in design, specification, construction and appliances adequate safeguards against danger to life and property. All buildings should be required by law to be fitted with adequate fire exits and escapes proportioned to their human occupancy in accord with reasonable exit tests. Outside fire escapes are deemed the least desirable of all forms."

Topic 4—"Building Codes"

NOTE.—The *aggregate* of *unit* building construction problems becomes the like *Community* problem, or the Building Code (State or local).

MR. EVANS: The next topic is "Building Codes," under the appropriate resolution announced. I will call your attention to the fact that we are half an hour late and that this is an important subject.

I will say in explanation of the rather elaborate tentative resolution that the subject of "Building Codes" has consumed as much time and thought in this country as anything I know—discussed by every society, individual, State and municipal government, concerned, *ad nauseam,* and we have not gotten anywhere. The idea is to limit the range of discussion so as to reach some central thought or principle.

The first paper on this topic will be presented by Mr. Boyd:

"BUILDING CODES"—1

By Mr. D. Knickerbacker Boyd, Chairman of the Publicity Committee of the American Institute of Architects, and Mr. W. L. Plack, both Fellows of the American Institute of Architects, and Members of the Philadelphia Committee on Revision of the Building Laws in the Commonwealth of Pennsylvania, Philadelphia

No words of ours are needed to more adequately express a recognition of the need for governmental control through a State code than a statement of the fact that there is in this great State at the present time a commission, created by act of legislature and appointed by the Governor, which has already devoted nearly two years of constant study to the subject of correlating, revising and originating laws governing the construction of buildings.

This commonwealth has realized, as others certainly will realize later, the necessity for a codification of its existing laws and the creation of new ones to govern those portions of its confines where absolutely no laws apply.

This Commission has been endeavoring in a most thorough manner to get the views of everyone in the State competent to express them. A committee was formed here in Philadelphia which met for several months and formulated suggestions which were submitted to the commission. The committee, of which we were members, was composed of representatives from the following bodies or interests, which are mentioned to show how thoroughly representative were its views:

The Philadelphia Chapter of the American Institute of Architects
The Master Builders' Exchange
The Engineers' Club
The Philadelphia Fire Underwriters' Association
The Philadelphia Fire Prevention Commission
The Philadelphia Housing Commission
The Operative Builders' Association

The Real Estate Brokers' Association
The Chief of the Bureau of Building Inspection
An expert on Re-Inforced Concrete Construction
An attorney versed in building laws

Nothing we might say could be of greater value in opening the discussion on the important subject before us than to quote extracts from the act creating the State commission and to recite the recommendations made by the Philadelphia committee before referred to. A general demand existed for this legislation and among the many requests for the creation of the commission the following is quoted:

> "The Pennsylvania State Association of the American Institute of Architects recognizes the unsystematic and fragmentary character of the Acts of Assembly with reference to the construction of buildings and the safeguarding of life and property within the commonwealth and deplores the fact that in this regard our State has not kept pace with the march of progress in many of the varied lines of invention, improvement and adaptation in the materials and methods of construction now in use and not regulated by law, as in such cases should be provided."

From the Act of Assembly we quote part of the duties of the Commission, as follows:

> "To ascertain from investigation the proper methods of construction and erection of buildings within the commonwealth and what precautions are necessary for the safe construction thereof and the proper safeguarding of health and life of persons occupying the same and to determine the strength and character of various materials used in buildings in this commonwealth and the relative value of each as constructive material, and to prepare a bill to the legislature as they shall deem necessary to protect the welfare and best interests of the owners and occupiers of said buildings, and to regulate the erection and construction of buildings generally within the commonwealth, including such existing regulations as are now deemed valuable, and supplementing the same by such new legislation as may be necessary to regulate the use of new materials and methods of construction not now provided by law."

And now we quote in full the recommendations made by the Philadelphia Committee:

1. There should be a uniform building code whose building requirements should be applicable to the whole State.
2. There should be created an administrative department for the State, clothed with proper powers to enforce the provisions of the building code, but its jurisdiction should not extend to cities of the first and second classes.
3. All cities, boroughs and townships of the first class should have the power to enact ordinances regulating buildings within their territory not inconsistent with the provisions of the general building code.
4. All cities, boroughs and townships of the first class should have the power to organize administrative departments for the en-

forcement of the provisions of the building code and of such local ordinances as may have been enacted. Such administrative departments in cities of the first and second class should be altogether independent of the State department, but in all other municipalities the State department should have supervisory power over the local department.

5. According to the character of their construction, buildings should be divided into five grades or classes, buildings of the first class being fire-resistant and otherwise of the best construction.
6. All buildings of the following sorts should be required to be of the first class or grade of construction, to wit:

(a) All buildings to be used in whole or in part as theaters or places of amusement and public entertainment where stage scenery and apparatus are employed, or for moving-picture exhibitions or as garages, excepting one-story garages accommodating not more than four automobiles for private use.

(b) All buildings more than two stories high, used in whole or in part as hospitals, asylums, institutions for the care and treatment of persons, public halls, hotels or lodging houses.

(c) All buildings more than two stories high used in whole or in part as apartment or tenement houses where any floor or story is occupied by more than one family, and all buildings more than three stories high used as apartment or tenement houses.

(d) All buildings more than two stories high and having more than 2000 square feet of floor space used for the sale of merchandise.

(e) All buildings more than four stories high and more than 65 feet high.

(f) All buildings of an undivided area between exterior lines of more than 25,000 square feet.

(g) All buildings in a city block where the total assessed value of the property contained in such block is more than $........., and where the total number of persons inhabiting or employed in or about the buildings in said block shall exceed ....

7. The minimum width of dwelling houses shall be 14 feet.
8. No building used as a habitation for human beings shall occupy more than 80 per cent. of the lot upon which it is constructed.
9. All buildings to be used in whole or in part as theaters, places of amusement, or places of public assembly should have the same provisions for mechanical ventilation as is required for school houses by the present school code.
10. All division walls between buildings should be built of stone, brick, or other hard, incombustible, self-supporting material, extending through and above the roof.
11. All openings in floors, such as stairways, elevator shafts, chutes, etc., in buildings other than dwelling houses, should be enclosed from foundation to a point three feet above the roof by a self-supporting wall of brick, stone, or other hard, incombustible material, with openings protected by fire doors.

12. The height of all buildings should be regulated for the purpose of providing light and air to persons in or about them, as well as for the purpose of lessening the fire risk.
13. The first story of all buildings (except dwellings) in densely populated areas should be of fire-resistant construction.
14. The committee suggests to the State commission the advisability of providing that the basements of all buildings (except dwellings) in densely populated areas should have automatic equipment.
15. Proper means should be devised to enable the person erecting, repairing, or underpinning a party wall to enter upon his neighbor's premises for the purpose of protecting his neighbor's property, pending such work.
16. No work should be permitted to be done on a building after notice is given of a violation of the building laws without obtaining a new permit from the proper administrative department, and the doing of any work without such a permit should be made a misdemeanor, punishable by imprisonment or fine, or both, in the discretion of the court.
17. There should be an annual inspection, by State or local inspectors, of all buildings, with such exceptions as to isolated buildings and buildings erected in sparsely settled country, as may be necessary to render practicable the proper administration of the law. The exceptions ought to be clearly defined in the law.
18. An annual license should be required for the occupancy of all buildings, except such as are exempted from the annual inspection, and a new license should be required for any change in the occupancy made within the year for which the annual license was issued. No license should be issued until the applicant has complied with all the requirements of the law respecting the construction of buildings to be occupied for the purpose for which it is intended to occupy the building in question. A moderate fee should be charged for the license. In cities this fee ought to be sufficient to cover the expense of issuing the license and making the annual inspection. It is only by an occupancy license and annual inspection that the observance of the law can be adequately enforced. Occupying or permitting a building to be occupied without the requisite license, or occupying or permitting a building to be occupied for a purpose other than that for which the license was obtained, should be made punishable in a summary proceeding. Each day's violation of the law should be regarded as a distinct offense.
19. The code ought not only to provide for the structural safety of buildings and for their protection against the fire hazard, but it ought to also provide for the safety, health and general wellbeing of the occupants.

20. The requirements of the building code and of the statutes having in part the same purpose (those relating to the public health, to protection against fire, and to factory conditions) should be made consistent.
21. The duties of the administrative departments performing in part the same functions should be made coöperative and conflicts and duplications avoided.
22. The Code should contain a section clearly defining its terms.

We offer this as the nucleus of a modern code. We make the following further suggestions for discussion at this time:

That, in addition to requiring sprinklers in the basements of all buildings in congested districts, sprinklers should be placed in the upper stories of all buildings high and large enough to be inaccessible to hose streams when thrown from a proper angle.

That the duties of the fire marshals or other authorities on fire prevention in every district shall be brought into harmony with the duties of the building inspection department, to the end that all architects shall submit drawings for prospective buildings or alterations which shall be approved by these authorities in coöperation, before any permits are granted. We understand that the commission is working to bring all the administrative functions of the State, which have to do with the construction, occupancy, and care of buildings, under one great department.

It is believed that the code now being drafted for this State will go so far as to say that all constructional work shall be performed and the drawings and specifications therefor shall be prepared by those only whose competence has been established through duly authorized processes of registration.

It is believed also that this modern code will declare that high buildings rob adjoining owners of light and air and deprive them of that protection against conflagration to which they are also entitled, and will prohibit them because they are a menace to the health and safety of the community.

In closing our contribution to this topic it seems fit that we should emphasize the important rôle to be played by the architects of America in bringing about an improved construction, pending the passage of that legislation which will give them the support of the law in addition to that moral suasion which they now so often exercise. During that interval, which we trust will be brief, the architect must assume to advise all prospective builders that reasonable fire-resisting methods of construction and fire-prevention measures shall be observed.

MR. EVANS: I would suggest, with reservation, that as this whole subject is so interwoven we might with advantage hear the papers *in toto* before we begin to debate them.

The next paper on this topic is by Mr. Robert D. Kohn, architect and for years intimately connected with the Committee on Public Safety of New York City.

"THE ESSENTIALS OF STATE AND LOCAL BUILDING LEGISLATION"

By Mr. Robert D. Kohn, of New York City, President of the National Fire Protection Association

I have in the beginning tried to briefly outline the histórical aspect of this subject in about forty words, and I find we have certainly moved slowly in methods of building legislation.

As early as 1761 an ordinance was adopted calling for the "more effectual prevention of fires and for regulating buildings" in the City of New York. This ordinance required that every building in the city "south of Fresh Water shall be made of stone or brick and roofed with tile or slate." Our Colonial forefathers were aware of the fire hazard and were willing to adopt legislation more drastic than even to-day, after 150 years, is in force in the average community as congested as was the New York of 1761. There is also recorded as early as 1730 an ordinance against the construction of "wooden chimnies lathed and plastered on the inside." That ordinance, at any rate, seems to have been effective. We need hardly worry about this particular form of construction to-day.

At a later period the moving impulse in building legislation was the fear of defective construction, the fear of collapse. The development of legislation seems to have been along the lines of constructive safety rather than of safety of life and property against the fire hazard. Under that impulse building codes have gradually become manuals of instruction. Owing to the ignorance of a majority of constructors, it seemed necessary to the framers of our laws during the major part of the 19th century to prescribe very definite rules for every possible condition which might arise in construction. The larger business buildings appeared only to be developments of the smaller residence types, hence too many laws seemed to be merely enlarged requirements of those applicable originally to small buildings. They were all based on the assumption that the constructor was ignorant and needed to be told exactly what to do and what not to do. We are still suffering to a great extent to-day from the idiotic series of rules which for example said, "for a building 55 feet wide you must have beams so thick," etc.

The time has come when all this should be changed. Not only in cities where congestion is great, but even in suburban and farming districts the increased complication of human life and industry has brought about increased hazards and everywhere the need of drastic building regulations is manifest. The reaction from the indifference of the past is, however, likely to produce a new danger. We are likely to inflict upon our communities laws so specific that they will absolutely prevent individual initiative and the discovery of new and desirable forms of construction. What we need to-day are not *manuals to guide the ignorant,* not statements of what shall be done, but laws indicating the *measure of safety* to be provided in building construction, no matter where erected. We must leave to the individual the working out of *means* by which these measures of safety shall be attained. In my opinion the genius of the American people has produced the progress it has in our great country because *left* in a measure alone; perhaps left alone too much. We must not build what will endanger our neighbor. We must not, however, go to the other extreme and hamper our builder. I think it is important to insist on that when considering some of this drastic legislation.

In any such program the laws must of necessity require a certain measure of competence and knowledge in the persons responsible for construction. Such laws will therefore have to distinctly specify the qualifications of the responsible builder, constructor or architect; varying the degree of required training and experience according to the importance and complication of the particular type of building to be erected.

The problem then before us is this: To prepare an outline building code, the mere skeleton of conditions necessary in construction work, so that the law, whether State or local, shall impose upon the constructor or designer only such conditions as may be essential to safety. I am trying to outline what a typical—minimum, we will say—building code for a State might provide. These conditions essential to a building code might be summed up as follows:

1. An authorization for the appointment of an officer or the establishment of a bureau or department of control and supervision over construction work and for the inspection of maintenance conditions after completion.
2. A definition of the extent of the powers of such officers, bureau or department.
3. A provision for the supply of funds for the support of such department, either from the tax rate or by license or permit fees.
4. A statement as to the minimum data to be supplied to the department and the nature of the permits to be issued before any construction work may be begun; also the qualifications and responsibility of the person filing such data and supervising the construction.
5. A requirement as to certificates of approval of occupancy and use to be issued when construction work is completed, and the vesting of power to withdraw such certificate if the structure is not maintained in safe condition after completion.
6. A classification of types of buildings according to the hazard involved by the nature of their occupancy and use.
7. A simple classification of types of construction and the areas within which and the nature of the buildings in which such types may be employed; the requirements as to incombustibility within different districts being entirely proportioned to their congestion of population and the contiguity of buildings.
8. A provision as to light and air spaces for various types of buildings.
9. A restriction as to permissible areas within fire walls.
10. A provision as to requisite exit facilities dependent on occupancy and height.
11. A provision as to the enclosure of all communications between stories, such as stairs, shafts, ducts, etc.
12. A provision for fire fighting apparatus—standpipes, sprinklers, etc.—dependent on height, area and occupancy.
13. A provision for the incombustible nature of all exterior exposures—windows, doors, roofs, skylights, etc.

14. A requirement as to minimum incombustible protection for exterior and interior exposed structual members, such as columns, beams, girders, etc.

15. A requirement as to protection against ignition from interior exposures—chimney flues, furnaces, hot-air ducts, steam pipes, smoke pipes, etc.

16. A statement of basic units of maximum permissible stress upon various materials, factors of safety and formulas to be used in calculations (for those few cases where varying engineering practice needs determination).

NOTE.—That clause is rather important in my opinion. I am suggesting there merely a statement as to the basis of calculation, the maximum stress to be permitted in construction; that is the only thing I would give, and the constructor of these buildings should have the knowledge to figure it out for himself. The time has arrived when we must stop stating that a beam 26 feet long must be so and so thick for a dwelling house, etc., and permitting building to be erected under such empirical rules without regard to what uses the building will be put to or how many people will occupy it. We must have expert knowledge in the constructor.

17. A provision for minimum floor loads permissible as a basis for calculation in various types of occupancy.

18. A provision for penalties for the violation of laws and ordinances.

19. A provision for a permanent board of council composed of architects, structural engineers, fire-protection experts and builders, which council is authorized to modify the requirements of the code where new or equally good methods of construction are proposed.

In the construction of such a code it is most important that this consideration shall be kept in mind, namely, that the requirements for incombustible construction shall be made as simple as is consistent with reasonable safety, and the use of combustible material of any kind shall be hedged about with as many protective features as is consistent with fairness. The time has come when the increasing scarcity of wood and the constantly lowering price of incombustible material makes combustible construction almost an anachronism. In the case of at least 50 per cent. of the buildings being erected to-day in cities and villages where combustible material is used, incombustible material could be substituted with real economy. Ignorance of the possibility of cheap incombustible construction is responsible for more bad building to-day than is the element of cost. Ignorance of the proper methods of protection to life against the fire hazard is responsible for more losses than is either wilful neglect or economy. In any program of fire-preventive legislation the education of the public will have to be for many years an essential part.

I have cases in my own practice, if I may state them, where the cost inside in a large house was 8 per cent. between a building with wooden beams and a building of fire-resistant construction. I have the figures of a number of buildings where the cost of hollow tiles was more than three, four and five thousand dollars; others were eight and ten thousand dollars. It was not more than 8 per cent. over the ordinary cost of shingle construction. That may be a big item to the man having only a few hundred dollars with which to build. In the eastern part of the country, where hollow block can be had, I would doubt whether the ordinary man is not willing to spend $500 additional in order to make that house warmer and safer from fire. Ignorance is the main thing we have to contend with.

One of the elements that is certain to militate against the efficiency of building code legislation is the opposition of interested trades and industries. Whenever specific requirements are defined with regard to the use of certain materials there always appears opposition from the producers of all other materials of similar nature. It is one great advantage of the program here outlined—a program providing for code legislation as to essentials only—that it would permit the use of any material that would meet the basic conditions defined in the law. To cite an instance: A code might merely say that incombustible protection against exposures to fire should be of such material as would withstand a temperature of 2000 degrees for two hours without impairing its strength. Under such an imaginary clause it would be possible to use protected steel, concrete of a certain mixture, hard-burned tile, gypsum in certain mixtures, and any other material of equal fire resistance. It is that type of code legislation which we need in this country; basic legislation; legislation as to the essentials of protection. The simplest form is the best form. Detailed manuals of building construction should be avoided at all hazards.

MR. EVANS: I will take the liberty of injecting here a third paper not appearing on our formal program, and the reason is I couldn't get at it in the short time at our disposal. This is a report of the General Committee representing Cleveland organizations on the proposed Ohio State Building Code; and I shall ask Mr. Virgil G. Marani, a member of that committee, to read it to you. He knows the building conditions in his State. Following this will be a paper on the smaller village building codes.

MR. MARANI: I am very thankful to you, Mr. Chairman, for the privilege of reading this. Just after we got together and had passed this to the Ohio State Legislature there was much opposition to the State building code, as written and submitted to our society for inspection, because it endeavored to specify everything in detail and minuteness; for instance, as to the way fire escapes should be built, the size of angles, the size of washer and nut to be attached to the end of rods which came through, etc. Ridiculous! The State building code promised at the start to be so large it would take eight to ten volumes of 300 to 400 pages each before we got through with it. It was because we foresaw what was coming that we drafted this resolution, and it is strange how nearly the recommendations are like yours.

Report of the Joint Committee Representing Cleveland Organizations on the Proposed Ohio State Building Code

To the Ohio State Building Code Commission,

GENTLEMEN:—The joint committee representing the Cleveland Chapter American Institute of Architects, The Builders Exchange and the Cleveland Engineering Society, has held frequent meetings since the receipt from you, the latter part of September and early October, of copies of proposed additional sections to the Ohio State building code, and as the result of these deliberations unites in sending you this communication expressing the views of said committee.

It is the judgment of the committee, after careful consideration, that the best interests of all persons connected with building operations throughout the State and the public in general can best be conserved by the enactment of a set of building regulations dealing with general terms and containing minimum requirements, rather than endeavor to enact a series of regulations in the form of rigid specifications and attempt to enforce these specifications alike in the rural districts and the cities. Such a general code, we believe, should be sufficiently comprehensive to fully protect life, health and property as a function of the State, leaving to individual cities the right to enact such building regulations and enforce the same as may be deemed best suited to the needs of these separate communities. This policy was recognized by the State legislature in the enactment of the municipal code law in 1902 when the right was given to all cities to establish building departments and regulate the construction of buildings within their own boundaries. Furthermore, it should be recognized that since the work of preparing a State building code was started an amendment to the State Constitution has been approved by the voters of Ohio, giving a large measure of home rule to municipalities. This latter action evidently contemplates that the fullest measure of local government shall be assumed by cities, including the regulation of building operations and the conduct of all improvements.

In the opinion of our committee, an important question is raised as to the extent of the powers of the State as distinct from those of cities in the matter of building regulations. The City Solicitor of Cleveland has advised the council that cities have full power to enact their own building regulations under the home rule amendment in so far as no conflict shall be entailed with the police power of the State. Heretofore building regulations have been adopted by the cities as such, and we believe that this body of law now on the municipal statute books would be weakened by State enactment, and confusion would at once arise as to the authority for decisions and enforcement. We believe that it would be better to leave with the cities their present rights in this regard for the reason that authority is thus centralized in officials who are directly responsible to the heads of the municipality, and that this function of city government is thus brought more closely to the people, avoiding possible injustice and hardship. The councils of municipalities can readily readjust existing regulations to meet changing conditions, while such action would be slow and difficult if made through the medium of State legislatures. In addition to this objection is the fact that State officials are removed from direct contact with citizens in sections of the State outside of Columbus and that conflict between State and city officials is probable, especially when of opposite political parties. For these reasons and others of like character, this committee believes the State of Ohio, as one of the first and very few States to consider the adoption of statewide building regulations, should favor a general code, framed to properly protect the interests of the public, rather than to attempt a detailed and stringent code such as the one now up for consideration.

Commenting upon the sections of the code as submitted to us, we have the following to say:

We believe that the code as written is too cumbersome and that it will be extremely difficult if not wholly impossible of enforcement.

(a) Requiring of plans to be filed at Columbus and permits granted by the State will impose needless hardship on all persons conducting operations, entailing long delays and financial losses that will obstruct the progress of the buiding industry.

(b) The code contains upward of 300 pages of closely-written technical material. Experience has shown that attempts to enforce such a code have not been successful. As conditions vary in different localities, a large department with inspectors for each and all trades would be necessary to inspect operations to see that all of these requirements are observed. The City of Cleveland with 49 square miles of territory has a department comprising 53 men. The State of Ohio with 40,000 square miles of territory would require about 5000 men on the basis of ten times the amount of territory allotted in Cleveland for each individual inspector. The cost of maintaining such a department for salaries of inspectors alone, to say nothing of office administrations and traveling expenses, would, on this basis, be upward of half a million dollars to be provided from the public treasury.

(c) The Cleveland code, adopted 8 years ago, is not enforcible to upwards of 30 per cent. of its requirements, indicating the difficulty of carrying out specific regulations when the same are too cumbersome and technical.

(d) The sections of the State code adopted two years ago were hastily conceived, as indicated by the preparation of eight pages of revision now submitted for correction of twelve titles.

(e) In our opinion, the methods of adjusting appeals that may be made from rulings in the State code is not likely to prove satisfactory, as we believe such a court should be composed of architects, engineers and builders of long experience and wide knowledge in matters of building. Without any intended reflection upon the officials named as a board of appeals in the proposed code, we submit that frequent changes in these offices resulting from the changing of administrations would not be conducive to permanent confidence on the part of those affected by the code.

(f) We believe that a longer period of time than that granted by the commission should be allowed to the various interests of the State affected by the code to consider the same and express their views. Aside from typewritten copies, no published reproduction of the code has been available and comparatively few persons have been able to investigate its requirements.

To conclude, we make the following recommendation:

That the sections passed by the last session of the legislature be repealed and that a new code be prepared on much broader lines, requirements being made sufficient to safeguard life, limb and property throughout the State of Ohio, and being flexible enough to allow the different municipalities to work out their own detailed specifications under said code according to their conditions and experience.

Very respectfully,

BENJAMIN S. HUBBELL
Chairman Building Code Committee, Cleveland Chapter American Institute of Architects
E. W. REAUGH
Chairman Building Code Committee, Builders Exchange of Cleveland
VIRGIL G. MARANI
Chairman Building Code Committee, Cleveland Engineering Society

December, 1912

NOTE.—The above report was approved by the Board of Directors of the Cleveland Chamber of Commerce on November 27, 1912, and was also approved by the Building Department of the City of Cleveland.

A similar report was adopted by the Cleveland Inspection Bureau (Stock Insurance).—ED.

MR. EVANS: You now have the points of view of those who are developing—whose principal purpose it is to develop—a code to meet great city, and all other, conditions in principle. There is another point of view which you will now have presented to you—a manual of construction code for the small community all over the country. Where a man starts to put up a building (and it may be a picture show, or butcher shop, or any one of a dozen tenancies before it is roofed in) this code would require the builder to put up his structure with a measure of safety, no matter what its tenancy might be.

I will now introduce Mr. Drake, lawyer and insurance expert, who has been very active in the movement for State fire-prevention associations all over the country.

"UNIFORM STATE AND CITY BUILDING CODES FOR UNIVERSAL APPLICATION"

By Mr. Frank M. Drake, of Louisville, Ky., Vice-President National Fire Protection Association

The form of this proposed small community code is just going through the committees of the National Fire Prevention Association for discussion. As many of you know, I come from the rural fire prevention section of this country, in contradistinction to the great metropolitan centers represented here this morning. Therefore I bring somewhat different viewpoint from those you have already been called upon to hear, and it presents slightly different conditions and different problems. The problem in dealing with the great mass of this country, of which our rural community is a type, is not that of saying what shall be done and telling how to do it, but of educating the people to the conception of the problem. The country people of the nation are easy to deal with when you persuade them that they need to do anything. But the question is in persuading them that they need to take action at all. If you do that it is not difficult to get them to accept the standards set by those they recognize as capable of making those standards.

Were it as simple to get the people of our country to apply the remedies for fire hazard as it is for them to ascertain what those remedies are, we would have no fire waste problem with which to deal.

Care, common sense, and the enforcement of natural laws are the essentials to such degree that, in legislating toward the solution of this problem of conservation, we find that we principally stand in need of having the people told what shall not be done. It is, to our shame, a need, rather of negative than of constructive education.

Although from the standpoint of practical achievement it is beginning at the wrong end, we will first attempt to enumerate those factors that may, with all due consideration for existing conditions, be dealt with by the State. A State code should and must necessarily have minimum requirements. In the first place, State laws are only reflection and consummation of the most general public sentiment; and, in addition to that controlling factor of passage and enforcement, a State code should deal only with features which are universal in existence and effect and which have a character of permanence, so as to be readily detected and supervised. For this reason a State code should not deal with questions of occupancy except as to safety of life. The details of a State code could probably include the following provisions:

1. Safe chimneys and flues, fire places and hearths.
2. Safe arrangement of all heating apparatus.
3. Protection (interior) in buildings of height, inaccessibility and crowded occupancy.
4. Exit arrangements in buildings of height and crowded occupancy.
5. Regulation of theaters, amusement halls and moving-picture shows. The last named are now general in towns so small they do not have a theater, and no effort is made to regulate by local ordinance.

NOTE.—I purposely mention moving-picture shows separately, after having spoken of amusement halls, because moving-picture shows are now so general in the smaller communities having no theaters or regulation by ordinance. There is at present a pressing need that the State do something to govern this most fearful hazard to the women and children of our country. That is why I mention them especially. If you will allow me to select only one essential that all our States should deal with, outside of the safe arrangement of heating appliances, it would be that we should regulate these crowded moving-picture

theaters in every town in the United States, which are attended by women and children in such countless throngs.

6. Protection against exposure. Public sentiment would probably not go so far at this time as to support State interference of this kind, but it must be mentioned because no factor contributes so greatly to the destruction of the taxable wealth of the State, and therefore gives rise to so great a single source of concern to the commonwealth.

In considering the elements of a municipal code we must be guided by the same respect for essentials, viewed, of course, from the standpoint of local environment.

In addition to these primary factors which have been mentioned as properly coming within the province of the State at large, the following seem to be the restrictions necessary to be adopted by any community which has an earnest purpose to deal effectively with the fire problem:

1. Fire limits, restricting at least exterior combustible construction.
2. Restriction of shingle roofs.
3. Wall thicknesses.
4. Lighting and power.
5. Floor, roof and sidewalk openings.
6. Constructive features of occupancies involving use of high temperatures or extreme combustibility.
7. Segregation of occupancies known as "conflagration-breeders"—such as livery stables, garages, hay warehouses.

A municipal code should be uniform and mandatory; and it should not allow the granting of exceptions by city authorities in individual cases.

In towns of such size as to afford the means of administration, there should also be included in a municipal code such features of control—inspection, funds, permit and certificates—as are adaptable to local conditions.

A municipal code for general use in all classes of towns should probably be published in such manner that each subject is so treated that all or a portion may be used, as local conditions make opportune.

It is probable that very shortly a model municipal code for general use in small towns and cities, prepared carefully and authoritatively, will be available, as much work has been done toward filling this important need in a reasonably effective manner. (The N. F. P. A. has now adopted such a code, and will provide copies on request.) Regardless of all the preparation of the material for such use, the vital factor in working out a solution of the fire-waste problem through the means of legal regulation is the citizen who wants to see it done. In arousing his interest, so elemental, so basic to our purpose, we may offer him the following profit for his labors:

The saving of lives.

A diminution of economic waste in timber, etc.

The saving of property from needless destruction.

NOTE.—You may think there is duplication of thought in mentioning *condemnation of economic waste* and *saving of property from destruction.* The reason I draw a distinction in attempting to reduce the subject to its primary have assisted in the drafting of building codes for some of our smaller suburban towns around Boston. As one is continually met, however, with the statement that if we did what we ought to do in one town all the builders would go over the border and into a town where such requirements were not enacted, it seems to me that a minimum State ordinance covering all towns would be an advantage. Nevertheless, I wish to call attention to the fact that minimum requirements always become maximum requirements; that just so sure as you relieve the city or town of the responsibility of drafting its own requirements by having a minimum State law, it will never go any farther, and your minimum requirements will therefore become your maximum requirements. I am strongly of the opinion that State legislation should include perfectly adequate and satisfactory requirements, and then put it up to those cities and towns to take that State law by popular vote. Then they have authority to take what the State suggests and recommends to them or else assume the responsibility of making less rigid requirements. If they fail, the responsibility is on them, because they had offered to them, from the State, a code of requirements as good as any city or town needs. That is rather my idea of the advisability of State minimum requirements, because I know absolutely from my business that where we have a minimum charge in a schedule for any defective construction it always becomes the maximum charge unless there is some extremely flagrant case, and I fear we will find in our State laws that it will work to our disadvantage unless we subdivided our cities and towns into so many classes as to make the condition of affairs so confusing that it would be worse almost than nothing at all.

I am not sure just what is the most advisable course to pursue, but I am sure it is a subject needing very careful consideration and discussion before any one can be certain what course is best.

MR. S. G. WEBB (New York): In the papers that have been read on this subject the general thought seemed to prevail that fundamentals shall be the basis of code legislation. Numbers of references have been made to requirements. On the question of requirements governing materials used in the construction of buildings there is very little in any existing requirements for the different *uses* of materials. I don't know, Mr. Chairman, whether I am anticipating another topic in suggesting that in this resolution some reference should be made to *standards of fire resistance*. If it is another topic I will ask that this point be considered then.

MR. EVANS: Mr. Webb, we are not going into any of these topics in detail. There are probably a hundred thousand things entering into the arrangements of structures in the United States. We are merely trying to announce the principles of construction. As to what the rules are, the States will have to work that out in their expert bodies, just as the details of the electrical code are worked out; but we are merely announcing here that there should be a proper building code in every State and city.

MR. WEBB: I understand that; but one of the topics to be brought up to-morrow is "Cumpulsory Physical Standards." My point may be more appropriate there, but couldn't we bring it up here when it intimately affects this question of codes?

MR. EVANS: That is not the question at the present time, but we will be glad to have your views under the appropriate topic to-morrow.

MR. MCDOWELL: As a member of the Pittsburgh commission I would say that we found difficulty in making ordinances satisfactory to the building department and the architects. The architects think they know all about a building and the building department wants safe construction. I remember the case of one department store where the floor load capacity as given by the architect was 40 per cent. less than that required by the Bureau of Building Construction, although his plans showed compliance with the requirements. Where the city ordinance, for instance, for the use of concrete interfered with a certain man's sale of his goods he took one or more of our nine councilmen to lunch, or somewhere, and persuaded them of the drastic features of that ordinance.

This week we put in an elaborate set of requirements on concrete construction; not as elaborate as in London, but one by which the building inspectors can classify and determine whether the building will come up to the requirements of the State law and the ordinance itself. Where these requirements are made it always throws the building department open to the charge of favoritism, and where they have a detailed set of requirements they can under that go to the architect and tell him just what is to be done. I remember Mr. Rudolph Miller, of New York, had an experience with a gentleman who, when he questioned him about the strength of his columns, said "L over R has nothing to do with this column."

MR. EVANS: Perhaps a slight confusion has occurred. My "Minimum Requirements" does not mean that the city of Pittsburgh shall have a sliding scale of requirements by which to tell you what to do, but that the State requirements will not permit any work to be done anywhere within its borders below a certain level of requirements. It means some control at least in building construction everywhere; whereas now there is virtually no control, and that is where all this waste arises. It may be true, as a moral proposition, that if you give a man the choice of two loads to carry, unless you watch him closely he will always be found with the lighter one. But with respect to Mr. Goddard's analysis, it seems to me that a State requirement is not exactly analogous to a trade competition.

The tendency of the weak salesman is usually to gain his sales by low prices, so much so that the average merchant does not give his costs to his salesmen. I daresay the sale of insurance has the same difficulties; but where it comes to the exercise of the sovereign power of the State or municipality it seems to me far better now to adopt the firm position that what is right must be incorporated in future building up to a certain percentage, else no permit will issue. Let the city raise the minimum State requirements, if it so decides. It then rests with any city and its councils whether it shall have a scale above the State minimum which can be unfairly applied by favoritism; but the principle of forcing promptly everywhere some minimum excellence in building construction seems to me should be carried out to-day all over the country.

A word with respect to another remark of Mr. McDowell's with regard to the excessive voluntary commission work now demanded of the citizens in this country about everything. The city and State officials ought to attend to their work and put the men in there to do it. There should not be the necessity that a few public-spirited citizens should have to volunteer their time and money to bring about correction of so many public abuses of various sorts. The difficulty with all this commission and volunteer work is that if the man or group of men who are the mainspring of the energy and initiative get tired, or sick, or die, the movement breaks and comes to nothing. We are paying enough taxes in this country to have all these things attended to by our proper administrative officials, who are ample in number and adequately compensated. These must now be required to think and act more diligently and efficiently.

MR. KILLAM: I think men who have given us a code in general terms should aid us in formulating a specific code. We have had the other kind in Massachusetts and know what it means. Now let us examine the former kind and push the latter. I can see no reason for the confusion existing in Massachusetts on the subject, and no doubt here; why floor loads should be different in Boston than in Springfield; or why wall thicknesses should vary throughout any commonwealth. I would not allow municipalities to make different detailed laws on such things all over the State. In most cases municipal experts are not *experts*. For a little town they sometimes pass an ordinance suitable for a metropolis like New York. These requirements can be made at once for the whole State, expressed in detail, not leaving them for each engineer to work out. It does not take very long to print them in detail—floor loads, wall thicknesses, etc. A good many of the fire protective divisions could be put into the State law.

MR. EVANS: The proposal in regard to the smaller code ought to include that very thing.

MR. KILLAM: I didn't realize that the proposed small code took in every detail and the general code did not. Perhaps such a general law could include housing. I worked with the civic league mentioned by Mr. Goddard all last winter and know that the ***minimum*** requirements became the ***maximum;*** but it seems to me that minimum requirements are better than none at all. I don't believe in trusting in a position varying in effect between a town with and a town without a conscience. Let the State say: "You must come up to a certain requirement." It should be a state-wide minimum at least. It simplifies also the work of the architect and builder. There is no reason why the architect should have to learn the difference in laws because of going from one city to another to build. Later we must have a national standard that can be enforced throughout the United States.

PROF. WOOLSON: Speaking in regard to the remarks of the last gentleman referring to what Mr. Goddard has said, I think his own argument is the best justification for Mr. Goddard's position. Consider for instance stresses that may be allowed on timber in various towns. If you allow the minimum as a State regulation then the town which has a conscience wants something better and will indicate something better. Then you will have different stresses in different towns, which is the condition deplored. Therefore, I think Mr. Goddard's suggestion that the minimum requirements of the State should be good enough to be acceptable for the best towns, is an excellent one.

MR. KOHN: I was going to suggest a modified resolution, a little different from the one in the program, to meet the criticism. I agree with Mr. Goddard as to the importance of the problem. I don't agree with him as to the cure. I refer specifically to the detailed character of the code: "*Resolved,* That State and local building code legislation shall be enacted of such quality as will secure the maximum obtainable protection in buildings no matter where erected." That puts the whole thing on the basis of a growing standard.

MR. EVANS: I will ask the following gentlemen to act as a committee to suggest a properly amended resolution on this topic: Messrs. Goddard, Kohn, Boyd, Killam, Marani, Drake, Woolson and Plack, to adjourn to some corner of the room and make suggestions which they feel would cover this matter.

MR. GUERIN: I would ask that the gentlemen on the committee take into consideration all sorts of buildings, every kind of construction.

Where you raise the standard so high the suburban section of the city cannot develop. With respect to the boroughs of Brooklyn and Queens, the provisions of the building code as applied to the city of New York are too stringent for proper development of undeveloped areas. And as large cities develop you must keep that in view.

Mr. Drake: One final suggestion: There may be some confusion between the maximum and minimum requirements as to what are maximum and what minimum. In dealing with the smaller towns and the things required by the State, the thought is not as to the varying *character* of the standard but how the thing shall be done *to the degree* to which the communities can go. Let what is done be done in the best standard way. The State should only force necessities to a reasonable point, but it can properly require that adequate quality be employed in requirements on any given subject, and then reasonably limit the extent. I advocate simply a limit in extent, not quality, of control.

Mr. Evans: I desire to make several announcements: first, please be good enough to register. Second, the Curtis Publishing Company have a magnificent new building, covering a block at Sixth and Walnut streets, and they invite you to visit them and see their home. Third, the Automobile Club of Philadelphia, of which I am president, has the second largest club garage in the country at Twenty-third and Market streets, in the central section of the city, and you are asked to call and inspect the premises. Fourth, to-morrow afternoon the Department of Public Safety of the city has invited you to lunch at 1.30 p. m. at Belmont Mansion in Fairmount Park, and witness a police drill on Belmont Plateau afterward. The Automobile Club of Philadelphia, by the courtesy of its members and the activity of its superintendent, Mr. Hodge, has arranged for motor cars to meet you here to-morrow at 1 o'clock sharp. These will continue at your disposal after the drill to take you for a drive around the Park, which is well worth seeing.

On motion adjourned to reconvene at 2.00 p. m.

CONCLUSION

(From subsequent proceedings)

Mr. Goddard, chairman of the special committee to formulate a resolution on Topic 4, "Building Codes," brought in a unanimous report, embodied in the resolution given below. Its adoption was moved by Mr. Boyd and seconded by Mr. Mason, and unanimously voted by the Convention.

Mr. Evans remarked that this series of resolutions appeared to have reconciled several moderately diverging viewpoints and experiences, although it departed from the tentative ones under discussion; and further, that this result appeared as a good conclusion to Section C, Divisions 1 and 2, proposed, although less emphasis was finally laid on the creation of a simple manual of operation for towns and villages; and the need for more definite principles in building codes for large cities, which had been urged at the National Fire Protection Association Spring meeting.

Resolution Adopted on Topic 4

"It is the sense of this Convention that:—

(a) All building construction and reconstruction should be under government control, State or local, to the end that the greatest safety for the greatest number for the present and future should be assured;

(b) Each of the several States should adopt a State building code with requirements which local governing bodies may raise but not lower by local enactment, said requirements to be enforced by proper governmental machinery over all of each and every State;

(c) The classification of building construction is entirely one of relative ability to resist attacks by fire, and therefore in all building codes the term "fireproof" should be replaced by "fire-resistant," and ordinary frame construction should be classed as "combustible"; and

(d) The National Fire Protection Association is hereby requested to recommend approved standards of fire-resistant construction which may be used by States and municipalities in their respective building codes."

NOTE.—Section (d) was subsequently modified in its force and intent by Resolution adopted under Topic 8, "Compulsory Physical Standards," whereby the recommendations of the National Fire Protection Association and other originators of standards are to refer same for approval to the Bureau of Standards of the Department of Commerce of the National Government at Washington.—ED.

SECOND DAY, AFTERNOON SESSION

Topic 5—"Protection (Private)"

NOTE.—The best located and constructed unit building is now held to need *protection* (usually water supply and/or chemicals) to reasonably assure safety against fire for the building itself as well as for its contents in life and property—hence this consideration comes next in order after the actual construction (often with it).

The meeting was called to order 2.10 p. m. by the Chairman.

MR. EVANS: The first subject this afternoon is Topic 5; "Protection, Private." The tentative resolution is as announced. The first paper will be read by Mr. Stewart, of New York, followed by a second by Mr. Lacount, of Boston.

"FIRE PROTECTION (PRIVATE)"—1

By Mr. F. J. T. Stewart, Superintendent of Surveys of the New York Board of Fire Underwriters, New York City, and Chairman of the Executive Committee of the N. F. P. A.

The importance of fitting every building with proper mechanical aids to discover, alarm, and extinguish fire will no doubt be generally recognized. There may, however, be some chance for a difference of opinion, or a desire for information, with regard to just what chcaracter of protection is most efficient. It therefore seems appropriate to refer briefly to the recognized aids to discover, alarm and extinguish fire.

SUMMARY OF PRIVATE FIRE PROTECTION METHODS

(1) Discovery and Alarm of Fire.

Watchmen and watchmen's time-recording apparatus.
Automatic fire alarms.
Manual fire alarms.
Automatic sprinkler water-flow alarms.
Automatic journal alarms.

(2) Extinguishment of Fire.

Automatic sprinkler equipments.
Fire pails.
Chemical fire extinguishers.
Steam.
Standpipe and hose equipments.
Outside sprinkler systems.
Private hydrant systems.

Standards and detailed information covering all of the above subjects may be obtained from the National Fire Protection Association.

In the time allotted for this paper only a few brief comments are possible on each subject.

Discovery and Alarm of Fire

1. WATCHMEN AND WATCHMEN'S TIME-RECORDING APPARATUS

There are no doubt cases where watchmen have caused fires on account of their carelessness; nevertheless it is true that intelligent and able-bodied watchmen are ordinarily able by prompt action to control incipient fires, either directly or by giving an alarm. Thus the watchman is a valuable agent for the discovery, alarm and extinguishment of fire. The presence of a watchman is therefore important in most cases, especially in manufacturing plants and many mercantile establishments, to prevent or detect either fire or theft. In exceptional cases the constant patrolling by a watchman may not be essential or desirable, such as in warehouses used only for storage of merchandise in unbroken packages.

The watchman, in order to effectually prevent and detect fire, should regularly patrol the entire premises approximately once an hour when the plant is closed. The responsibility is great, and the faithful performance of such duties is tedious and monotonous.

Watchmen's time-recording apparatus is used with suitably located reporting stations to show that the watchman has regularly patrolled the entire premises. There are three classes of such service:

Portable watch clocks.
Local or private stationary clocks.
Central station supervisory systems.

In the first two systems the rounds of the watchman are recorded on clock dials to which the watchman does not have access. These removable dials are arranged to be examined daily by the proprietor and new dials provided. These two systems give good assurance that the watchman is attending to his duty, or at least it will be known next morning if he has not done so. With a central station system, the watchman is being watched almost every minute of the time by attendants at a central office, where the signals are electrically transmitted and recorded. If the watchman fails to turn in any signal within a few minutes after it is due a runner is dispatched to investigate.

2. AUTOMATIC FIRE ALARMS.

Automatic fire alarm systems depend upon thermostats placed on ceilings for the discovery of fire. There are two types of thermostats, one designed to operate at a fixed temperature and the other depending for its operation chiefly upon a predetermined rate of rise in temperature.

Most of the fixed temperature thermostats depend on fusible solder and are designed to operate at about 160 degrees in ordinary rooms where the normal temperature is seldom much in excess of 100 degrees. The thermostats are ordinarily designed to actuate an electrical circuit in their operation and by this means cause alarms to be registered at fire department headquarters or any other desired location. There are also pneumatic or pipe systems where the operation of the thermostat causes an air pressure to be transmitted which in turn actuates an electrical circuit.

Automatic fire alarm systems, when properly installed and reliably maintained, have been the means of saving considerable loss of life and property by reason of prompt discovery and alarm of fire. They should be more sensitive than automatic sprinklers.

3. MANUAL FIRE ALARMS.

These alarms are usually installed to supplement the public fire alarm service, similarly to the automatic alarm systems. It is thus possible to transmit alarms manually to the fire department by the aid of boxes distributed about the premises. The manual alarm service is more valuable when a watchman is employed, otherwise there may be no one to operate it when the plant is closed. A special form of local manual alarm service is used to supplement a private fire brigade or fire exit drill.

4. AUTOMATIC SPRINKLER WATER-FLOW ALARMS.

As the name indicates, these systems consist of apparatus for connection with water-flow alarm valves on sprinkler equipments and are designated to transmit such signals. The transmission and recording of alarms is similar to that described for automatic and manual fire alarm systems. The water-flow alarm valves are designed to operate when there is a flow of water equal to that discharged by one or more sprinkler heads and to withhold signals for water surges or variable pressures.

5. AUTOMATIC JOURNAL ALARMS.

Automatic journal alarms are installed chiefly in hazardous risks, such as grain elevators and other locations where there are fast-running journals. The system depends upon thermostats attached to each bearing and connected by wires to an annunciator at a suitable location, usually in the engine room. If the temperature of the bearing exceeds that at which the metal in the thermostat fuses, an electric circuit causes an alarm to be sounded.

Extinguishment of Fire

1. AUTOMATIC SPRINKLER EQUIPMENTS.

The most efficient fire extinguisher is an approved automatic sprinkler equipment installed throughout the premises. Comprehensive statistics extending over a period of about fifteen years show that the efficiency of automatic sprinklers has been approximately 95 per cent. After segregating failures due to lack of proper maintenance, the efficiency of the apparatus itself will be about 98 per cent. These statistics are based chiefly on equipments voluntarily installed under standards of the National Fire Protection Association and, as a rule, carefully maintained. Independently of other water supplies, every equipment should provide for the utilization of the public water system when it is available, either by direct connections or by connections made by the fire department immediately on arrival.

It is estimated that the majority of failures of automatic sprinkler equipments are due to lack of proper maintenance. For this reason special devices are in use to automatically supervise sprinkler equipments, with particular reference to condition of gate valves, temperature and amount of water in tanks, etc.

2. FIRE PAILS.

Perhaps more fires have been extinguished by pails of water than by any other fire protection device. It is important to encourage the liberal distribution of fire pails generally, even in buildings equipped with automatic sprinklers, as many incipient fires have been extinguished by the use of fire pails when they are conveniently at hand, and considerable damage thus saved by avoiding the operation of the automatic sprinklers.

3. CHEMICAL FIRE EXTINGUISHERS.

Hand fire extinguishers, like fire pails, are valuable agents for use in extinguishing incipient fires. There are various types of chemical fire extinguishers; the one most generally employed for private use being the 2½-gallon upset carbonic acid gas machine. One of the chief advantages of chemical fire extinguishers is their ability to deliver a stream under considerable pressure, throwing the extinguishing agent to a great distance and into places not readily accessible to water thrown from pails. For this reason both chemical fire extinguishers and pails should be provided.

4. STEAM.

Steam will often extinguish fire by smothering it and is especially suitable for confined spaces, such as oil or refuse vaults, dry rooms, etc. The steam supply is arranged to be operated either manually or automatically. It is desirable that the steam jet should be automatic and be provided with one or more fusible heads inside the room to be protected.

5. STANDPIPE AND HOSE EQUIPMENTS.

A properly equipped and maintained standpipe and hose system constitutes one of the best means for the extinguishment of fire. It is the only sufficient way other than by use of the sprinkler system to obtain effective fire streams on the upper stories of high buildings with a minimum loss of time. In such buildings they should be designed to afford a ready means for the control of incipient fires by the occupants, and should also be capable of sustaining the high-power streams required by the public fire department. The necessities of both classes of service should therefore be carefully considered, especially in the case of high buildings. For public fire department purposes it is especially desirable that the standpipe be located conveniently with regard to a smokeproof stair tower. Independently of other water supplies, every equipment should provide for the utilization of the public water system when it is available, either by direct connections or by connections made by the fire department immediately upon its arrival.

6. OUTSIDE SPRINKLER SYSTEMS.

These are usually installed over windows and are designed to protect against fires from neighboring buildings. They are not recommended for general use or to the exclusion of such protection as approved fire shutters or wireglass in metal sash and frames. Outside sprinklers are sometimes desirable to reinforce other window protection when the exposure is especially severe. The efficiency of outside sprinklers is apt to be affected by strong winds and other severe weather conditions. They require large water supplies and may be regarded as somewhat wasteful of water in proportion to their reliability. Outside sprinklers should not be used without first consulting with some one familiar with their merits and limitations.

7. PRIVATE HYDRANT SYSTEMS.

In plants where there is only a limited amount of public protection, or none at all, it is important to provide sufficient yard hydrants for the use of a well-drilled private fire brigade. A liberal amount of fire hose approved for mill-yard use should be furnished in accordance with the specifications of the National Fire Protection Association. The hose should be stored in hose houses located at the hydrants or on vehicles conveniently placed. It is important that an ample water supply from approved fire pumps or other reliable source should be provided, capable of delivering the requisite number of 1⅛-inch streams at ample pressure when the water is flowing.

MR. EVANS: Under this topic the following communication from Seattle is timely, about one of the *negative* things under the head of "Protection":

THE CITY OF SEATTLE
WASHINGTON

Oct. 6th, 1913.

MR. POWELL EVANS,
Chairman, Fire Prevention Commission,
Room 420, City Hall,
Philadelphia, Pa.

DEAR SIR:

I beg to acknowledge receipt of your invitation to attend the National Fire Prevention Convention to be held in Philadelphia, October 13th to 18th, and wish to express my very sincere regret of not being able to attend the session of this Convention.

As the head of the Wiring Inspection and Municipal Signal Bureau for this City, I wish to do everything within my power to further the objects and aims of so worthy an association; and will be pleased to receive any communications from the association to that end.

In a disastrous basement fire which occurred here on the morning of the 5th (yesterday) it was forcibly brought to our attention that all basements containing gas pipes should be equipped with a gas shut-off in the alley, or in the street immediately adjacent to the property. This matter is not so much one of prevention as it is one of protection for the firemen; but it reasonably comes under the head of prevention of spread of any fire.

We offer this suggestion for what it is worth; and extend to you our best wishes for a most instructive and entertaining Convention.

Yours very truly,
H. JOSLYN
City Electrician and Fourth Vice-President I. A. M. E.

The next paper on this topic is by Mr. Lacount:

"FIRE PROTECTION (PRIVATE)"—2

By Mr. H. O. Lacount, Assistant Secretary and Engineer Inspection Department of the Associated Factory (Mill) Mutual Fire Insurance Companies, Boston

I think there is very little that can be added to Mr. Stewart's paper. I say it in a different way but emphasize the same point.

Supplementing it in which are listed and briefly described various devices designed for use in connection with private fire protective equipments,—I desire to call attention to a few additional appliances; and, for the purpose of emphasis, to refer again to the value of the automatic sprinkler not only for the protection of the individual property, but also as one of the large factors in guarding against the conflagration hazard.

For the prompt discovery and most effective control and in many cases extinguishment of fires, under practically all conditions, *the automatic sprinkler stands at the head of the list.* But to accomplish this great result the sprinkler, even when properly installed, is as helpless as a sailboat in a calm unless the sprinkler system is connected to an adequate water supply. A high static pressure is not necessarily evidence of an adequate supply, for, on account of small or obstructed pipes, the pressure may be so reduced, even with a small amount of water flowing, that the supply is worthless. *Ample capacity* at *excellent pressure* alone constitutes an *adequate* supply. The public water system can usually furnish such a supply, and where high pressure services are installed these should be made available for the sprinkler equipments, preferably by direct connection, with controlling valves carefully located to insure accessibility at all times. A large elevated tank, with bottom at least 25 feet above highest sprinklers, and under some conditions a battery of pressure tanks as a part of a private equipment, may afford a satisfactory primary supply; and a fire pump of approved design and make is generally advisable as the heavy artillery to reinforce the other supplies with water in large volume and at high pressure, if necessary, and furnish protection even should all other supplies fail. In other words, install the automatic sprinkler broadly in all classes of buildings and give it all possible advantages, and it will return a fabulous dividend on the investment in the form of life, property, and business saved from the fire fiend.

Right here I fear that this statement may be taken too literally and that I may be understood to advise that sprinklers be installed everywhere, regardless of the conditions. That is not correct, for in a matter of this magnitude we should not go it blindly but reasonably with respect to the needs of the individual situation.

The same treatment should certainly not be given comparatively small areas in a well-constructed building containing a non-hazardous occupancy as large areas where hazardous processes are present.

However, knowing what the automatic sprinkler has done in the thousands of industrial plants insured in the Mutual companies, I am urging a wide extension of this protection in order to more promptly extinguish the small fire and thus avoid paying the tax of a conflagration.

The menace of the improperly closed sprinkler valve can not be too loudly emphasized; therefore, install no more valves than really required; place these where even at time of fire in the protected room they will be accessible; and by the most careful and systematic inspection keep these valves open. As well tie a man hand and foot and bid him run as be careless regarding this matter of closed sprinkler valves and expect the sprinkler to do its full duty.

As the man of but limited knowledge and experience is often of more value than the most learned doctor—because the former, being on the spot, can render first aid—so the hand appliances are important in substantially all buildings, and frequently will afford the means of handling the small fire with least damage, even where sprinklers are installed.

Besides those hand extinguishers mentioned in Mr. Stewart's paper, attention is called to the following two extinguishing agents especially suited to particular situations, viz: carbon tetrachloride and sawdust. When carbon tetrachloride is heated a non-inflammable heavier-than-air gas is generated, and this as an extinguishing agent where air drafts are not excessive, and can be used to advantage in the case of fires in gasoline and other volatile liquids where water would be of little use. Carbon tetrachloride, being a non-conductor, is also applicable as an extinguisher in the case of fires in electrical apparatus, even where high voltages are involved.

Fires in such liquids as lacquer, paint, japan, etc., can be easily extinguished by spreading sawdust over the surface of the burning material. The sawdust, being light, tends to float on the surface, so that with reasonably quick work the entire surface, if not too large, can be covered before the sawdust first applied sinks. The advantage of this over sand, formerly used, which sinks immediately, is at once apparent. Exhaustive tests have shown this material, especially when mixed with bicarbonate of soda in the proportion of 10 pounds of soda to a bushel of sawdust, to be a very efficient and readily applied extinguisher of fires in dipping tanks of moderate size containing various inflammable liquids.

The fire hazard due to lightning can be largely guarded against by equipping the more exposed parts of structures with a properly arranged system of rods thoroughly grounded. This applies particularly to chimneys, stacks, steeples, and the like. Lightning arresters should be installed on electric circuits entering buildings from lines run overhead through exposed country. Without effective ground connection the cost of these systems is wasted, and very frequently more than wasted, for what would otherwise be protection may easily become a hazard; therefore, the ground connection cannot be too good. By far the best ground will usually be an underground water pipe system, and wherever feasible this should be used. Where chimneys are equipped with permanent iron ladders, either inside or outside, the ladders should be as thoroughly grounded as in the case of the lightning rod system.

All large masses of metal should be grounded to guard against induced charges jumping to grounded conducting material nearby and setting fire to combustibles in the path of the discharges.

In buildings equipped throughout with automatic sprinklers there is a noticeable immunity from serious damage from lightning, and this is believed due to the screen or cage effect produced by the network of water pipes thoroughly grounded. The same would be true of the steel work in steel-framed buildings.

NOTE BY ED. ON "PROTECTION OF SCHOOLS"

In connection with the above two papers attention is called to a pamphlet entitled "Protection from Fire in Cleveland Public Schools. Report of the Committee on Public Safety. Approved by the Board of Directors of the Cleveland Chamber of Commerce December 3, 1913." This pamphlet is entitled to serious consideration from all State and city administrative officers touching school building construction and management.

MR. EVANS: The next phase of this topic, about the education of employees and fire drills to give effective result to protection in building occupancies, will be presented by Mr. Newburn.

"PROTECTION (PRIVATE)"

By Mr. R. H. Newburn, Superintendent of Insurance of the Pennsylvania Railroad Company, Philadelphia

"The Occupants of Every Building Should be Reasonably Educated Regarding the Physical Structure Thereof and How to Leave Same in a Quick and Orderly Manner, and be Organized to Fight Fire Therein"

For many years various municipal building laws have prescribed certain standards of construction which from time to time have been amended and revised in the interest of public safety, and recently these regulations have been extended to include facilities for safe egress in factories and, in some States, theaters as well. With all these important precautions there was still lacking a most important requirement, *i. e.*, some prearranged method by which the occupants could be dismissed in a prompt and orderly manner. It remained for the Triangle factory fire in New York City, with its toll of 145 lives, to demonstrate the need which has now been supplied by recent State enactments, making mandatory both fire and exit drills. These laws mark an important advance over the old conditions, and with improved design, safer building construction and proper fire-drill training, the safety of factory operatives should be reasonably well assured.

To obtain a proper understanding of the requirements of fire-drill training it is necessary to consider the classes of buildings with reference to their construction and occupancy. They will principally be found to include factories, theaters, public schools, department stores and residence buildings, such as dormitories, asylums, hospitals, hotels, etc. Of the buildings specified, we shall discuss the factory and theater as representing the two leading classes in which the conditions to be met include most of the essential features of all buildings with a large number of occupants. Under the new enactment of the State of New York, fire drills are required in every factory building two stories in height when more than 25 persons are employed above the ground floor.

There is some diversity of opinion as to the necessity for fire drills in factories and other similar buildings of fire-resistant construction. Experience would seem to indicate that fire drills should be required in all buildings, although the degree of fire resistance, together with the design and interior arrangement, may make unnecessary an elaborate organization and allow the drill to be of the simplest form. This is particularly the case with buildings of the bisectional type, where the occupants on one floor may be quickly dismissed horizontally through an opening in the fire wall to a zone of safety in the adjoining section, which is the ideal in exit arrangements.

For buildings of inferior construction, of combustible occupancy, poorly designed, with unprotected stairways and exits, fire-drill requirements should be more comprehensive in order that the defects may be offset and to some extent overcome by fire-drill efficiency.

In addition to determining whether the building is properly designed so that in the emergency of fire its occupants may readily escape, the primary object of the fire drill is to allay panic by substituting orderly self-restraint for confusion and disorder. An alarm of fire is no respecter of building construction, and its possibilities for disaster depend largely upon the combustibility of contents and the degree of excitability of the individual. The Triangle factory fire, occurring in a building where conditions were better than required by law and where many features of construction were considerably above the average, furnishes ample evidence that the fire-resistant qualities of a structure alone may be negligible in the general result; and, while there were other contributory causes, the determining factor in the rapid spread of fire and consequent loss of life was largely due to the inflammable nature of the contents.

A fire drill has two distinct functions: either to efficiently train the occupants regularly present in the building—such as factory operatives or children while attending school—in taking proper measures for their own safety; or to train employees in the handling of the general public in event of fire.

For the former class the problem is somewhat simplified by the opportunity afforded for regular training and drill practice, and familiarity with all means of exit, so that the question is largely confined to the character and frequency of drills to assure a prompt and orderly exit from the building.

To the latter class, involving the general public, belong those disasters which have caused the greatest fatalities, occurring in buildings where the public is assembled in large numbers, and where congestion and overcrowding may be of frequent occurrence.

Almost every factory building has certain peculiarities of design and interior arrangement which must be carefully considered in planning the exit drill; and while elaborate rules for installing factory drills have been prepared their application, except for smaller factory buildings having a limited number of employees, should be entrusted to someone familiar with the theory and practice of fire drill requirements, as the average employer is lacking in the experience necessary to enable him to effectively apply these rules.

To organize and install exit drills in large tenant factory buildings occupied by a number of firms requires specialized knowledge on many points, including the question of determining the capacity of aisles, stairways and exits, the selection of exits, and the proper distribution of the occupants to these exits, the execution of fire drill exercises, and many similar questions. In tenant buildings there must also be someone having jurisdiction over the drill of the entire building. Under the regulations of the Commissioner of Labor of the State of New Jersey each firm appoints its own chief, and in addition there is a building chief appointed having general charge over all who is given sole authority in the assignment of exits. Exits discharging horizontally into another building, or into another section of the same building cut off by a fire wall having standard openings, will accommodate a considerably larger number than ordinary stairways or outside fire escapes, and with the possibilities of personal injury materially reduced.

The factory laws of the State of New York regulating all new construction restrict the number of occupants on any one floor to 14 for every 22 inches in width of stairways, which will result in bringing this important question of adequate exit facilities to the general attention of the public.

Every employee should be instructed and made reasonably familiar with all the avenues of egress and as far as possible with the interior arrangement, particularly with reference to the stairways, wall openings, etc. Floor plans should be posted showing exits and aisles to be used. The importance of this provision was shown in the testimony of employees taken in connection with a large factory fire who were in ignorance of what had been provided for their safety. These precautions are particularly important for the occupants on the upper floors of loft buildings where the ordinary means of escape may be cut off by fire, necessitating crossing inside the building or to the roof to reach another unexposed exit.

All factory drills should be under the direction of a supervisory organization of employees, consisting of a chief of the exit drill, floor chief, room captains, stairway guards, inspectors and searchers. The necessity for these officials has been demonstrated in different fires which have been followed by loss of life, particularly the importance of searchers, whose duty is to visit toilet rooms, cloak rooms, etc. In the recent factory fire at Binghamton, N. Y., the bodies of 25 girls were found jammed near a cloak room where they had evidently gone to secure street clothing. All drill training should prohibit any attempt to secure street apparel.

For the purpose of sounding general building alarms, an electrically-operated system of the closed circuit type should be installed and indicate by strokes the floor from which the alarm has been given. An immediate response to alarms by all operatives should be required, regardless of the duty or work in hand.

For theaters, fire-drill training should include all of the force regularly on duty both on the stage and in the auditorium sections. Training of theater attendants should be directed more to the prevention of panics than to attempts at regulating the movements of a panic-stricken audience.

While it is necessary and important that all permanent employees be drilled and instructed in the use of all fire equipment and properly trained in the work of fire extinguishment, the first consideration is the safety of the audience, and every effort should be made to effect a prompt and orderly dismissal. Provision should be made for notification of fire by an electrically-operated alarm system, with box stations installed at convenient points and with recording apparatus in the business office or box office and near the switchboard on the stage.

The seating plan should be divided into sections and certain exits should be assigned to each section. Eash usher and doorman should be thoroughly familiar with the exit assignments and, wherever possible, should be required to remain on duty at his post throughout each performance.

The requirements for factories and theaters for fire extinguishment will necessitate only a small organization for the hand equipment, consisting of chemical extinguishers, fire pails and the hose lines from standpipes, in addition to supervision of automatic sprinkler equipments. For the larger shop or industrial plant the fire brigade organization should be carefully developed, particularly where they are distant from city protection and dependent largely on their own resources.

Frequently in laying out fire protection the organization of the fire brigade fails to receive the consideration which its importance deserves. It would seem but simple business economy that the expenditure for costly installations of pumps, water mains and hydrants to be effectively utilized should be supplemented by a trained fire brigade.

The ideal private fire brigade should be organized under a constitution, with its own by-laws and with provision for regular stated meetings. The conduct of the men within limits should be subject to discipline, and acts of unusual merit involving personal risk and good judgment fittingly rewarded. Membership in the fire brigade should be made attractive and sought after and carry with it some minor privileges.

No fixed rule can be followed in determining the makeup of a private fire brigade which would be adaptable to all classes of risk. Various rules and regulations defining the character of these organizations are available. In organizing the private fire brigade the same care and attention in the selection of the men should be given as it is customary to exercise in the employment of men in any line of work, and the efficiency of the fire brigade will be almost in direct proportion to the care and judgment exercised in the selection of its members. An important consideration is to secure men whose loyalty and sympathies are well known. Fitness for fire brigade service requires a combination of physical stamina and judgment with a strong constitution, and sight and hearing unimpaired. The members should have a general knowledge of the character of construction and occupancy of the building or plant, including location of stairways, elevator shafts, and the means of approach to attics and basements.

The fire-drill work in connection with fire extinguishment for both the factory and theater, as well as for the large shop and industrial plant, should be under the general direction of some one of the higher officers. The value of a well organized and trained brigade has been demonstrated in many plants.

Following the practice of public fire departments in a number of cities, notably our own city of Philadelphia, under the direction of the Fire Prevention Commission, the members of the private fire brigades should be trained in the work of fire prevention by making regular inspections and in correcting conditions where danger may exist by the removal of rubbish and by maintaining a high standard of housekeeping.

Under the direction of the Philadelphia Fire Prevention Commission regulations have also been adopted in connection with safeguarding theaters, in which employees of theaters are instructed and to some extent supervised by officers of the bureau of fire, each theater designating two of its regular employees to act as chief and assistant chief, who respectively have charge of those employees behind the proscenium wall and those in the auditorium. It is proposed that at the beginning of each theatrical season that the two employees so designated will be called to the city fire headquarters for the purpose of instruction and for suggestions as to methods of drilling the house employees in both fire extinguishment and in taking measures to insure safety of life.

Every effort should be made to not permit the fire drill to become merely a perfunctory exercise. Of all the precautions to insure safety of life and property, the fire drill and the exit drill furnish the single human element, and therefore contain all the possibilities of either success or failure.

MR. EVANS: You will find here later the form of public notice now in force in our theaters.

We were fortunate to find that Boston had worked out the science of this problem, where they made theaters do their own work and simply supervised it, and on a fixed plan. We have done that. Approximately twelve millions of people go to the theater in Philadelphia once a year; or the entire public, men, women and children eight times a year. Any comments?

MR. H. F. J. PORTER: These two papers are very excellent and cover the subject very completely, but I would like to inject a note of warning with regard to educating the fire extinguishing brigade in factories or theaters or any other places where we may have a volunteer fire-extinguishing brigade. I think we don't generally appreciate the responsibility on employees in an extinguishing brigade. We should train them and offer prizes for special bravery. There is no antagonist we have that is greater in its danger and severity than fire, and as we all know it takes a lifetime almost to educate a fireman to fight a fire; and yet we are about to appoint firemen in department stores, etc., who have not had any experience in firefighting and expect them in emergency to fight a fire and extinguish it. Some years ago I was requested by the Curtis Publishing Company to supervise their fire drill and brigade. It had been put in by a retired fireman of this city. A part of their proceeding was to have an alarm sounded when they would go to the hose rail and unroll the hose (a 2½-inch hose) and point it at an imaginary fire, with the expectation that should a fire occur they would extinguish it. I said at that time something to this effect: "Suppose they had educated those clerks to go up periodically to the attic and put on boxing gloves and jump around a punching bag for half an hour or so, and then on some particular occasion engage them in encounters with John L. Sullivan and Jim Corbett and several others and expect them to lick those veterans of the ring. They would have no more chance of licking those prizefighters than they would to extinguish the fire."

Just after the Newark fire the proprietor of a corset factory asked me to look over his brigade. After I looked into that factory I found on the first floor a laundry, and the corset factory three or four stories above that. While I was inspecting it a man rushed in and said that there was a fire two stories below. It became filled with a haze of smoke and we could not at once locaté the fire, but determined it was in a corner in a closet. They rushed up there with the extinguishers and squirted into that closet. A moment after that men came up from downstairs and said: "What are you doing? You have spoiled laundry that was all ready to go out." They had just had a snapshot taken by flashlight and the magnesia smoke came up through the floor, and gave the impression of a fire.

That is one thing people do not recognize—the character of a fire. We must instruct the people not to let the seat of fire get between them and the exit. They must not stay too long and attempt to fight fire with 2½-inch hose. I have taken this out and put in 1½-inch hose. Better than that is the fire extinguisher; and better than that is the pail. You get a pail quicker than anything else in case of fire. Also you can tell people that they may not be able to use a full pail but can do effective work with half a pail.

Mr. F. E. Cabot (Boston): I am very much struck by what the last speaker has said but I fear it is possible that he has only considered a part of the field. So far as his manufacturer of corsets is concerned, his illustration is good; but the gentleman who read the paper, and I, in a very much smaller way, have to deal with men who are accustomed to meeting danger and facing death, and I can assure you that our experience in the street railway company in Boston has proven it not only advisable that employees should fight fires with 2½-inch hose, but so far as a street railway barn was concerned on the west side, that was the only means by which it could have been saved. Since we have deliberately taught the men to use 2½-inch hose the fire department in every case has simply been the reinforcing body which made the victory certain.

I don't believe, when you are dealing with men who have to face electricity and dangers of the rail, that you need to be afraid of putting them between the fire and the exit.

Mr. W. R. Barton (St. Louis): On the question of private fire brigades I have to say that in my city the large department stores and wholesale houses maintain private fire brigades, but each member is drilled by the general fire department before being enrolled in the private company. On every floor there is 100 feet of 1½-inch hose, and with this a fire at the start can be held in check until outside assistance arrives.

Mr. Troth (Camden): We had a fire in our plant with no fire brigade and lost $13,000. Later, in 1912, we had a fire in a similar building and before the city department arrived the employees had it out and the loss was only $1700, and the men were working again the same day by 4 o'clock. The men fought that fire like trained veterans. We used 2½-inch lines.

Mr. Evans: Mr. Barton has gained his experience with the Missouri Pacific Railway Company, and Mr. Troth with the Victor Talking Machine Company.

Mr. Ballinger: I would like to ask a question about lightning protection, as to connecting or grounding the lightning rod to a water pipe. I have been afraid of doing that on account of the electrolysis.

Mr. Lacount: I don't see where electrolysis would come in. The lightning rod ordinarily is non-conducting. Personally I should not expect any electrolysis to take place. I see no objection to connecting the ground wire of a lightning arrester to a pipe where a water pipe is within reach.

Mr. Steel (Philadelphia): The question of providing a fire department in department stores was well illustrated in the Wanamaker store when I was in there. Fire occurred through the overheating of electric light wires in the celluloid goods on the first floor and was carried rapidly around the cases, and the private fire brigade extinguished it after cutting off the current. The fire was extinguished with 2½-inch hose. Customers in the next aisle didn't even know there had been any fire.

Mr. G. A. Gasser (Newark): We have found that in many cases private fire brigades have put out the fire, but in a few cases they failed to get control of the fire and then, after they find they cannot handle it, the fire department is notified. When putting the fire brigade in action it is well to instruct that some one man should be notified, whose duty it would be to promptly notify the fire department. The fire department would much rather go to a fire already put out than to be summoned to a fire that has gotten beyond control.

Mr. Lawrence J. Neale (New York City): Of course it all depends upon the conditions in the town where your shops or foundries are located. We direct all the members of our fire brigade to pull the city alarm box first, or the auxiliary box. There need not be any great advantage of the large sized hose over the 1½-inch as you can make the nozzles uniform with the thread of the city hydrants; and consequently if you have to couple it on to their hydrants before the arrival of the city department you can do it. In some of the small towns the members of the fire brigade are considered a company of the city fire department, and the city department depend on them a lot in certain sections.

When a fire is too small to require the use of 2½-inch hose we find it can usually be handled by the small fire extinguishers.

MR. C. H. GOGEL, JR. (Boston): The standpipe may become a source of danger—a hindrance to the fire department. The standpipe may be in operation at the ninth floor and the fire engine at the street level. In my judgment the pressure tank in the cellar should always be connected to the standpipe system. When you consider that in some of the high buildings the pressure amounts to 170 pounds per square inch, the fire engine operating against that operates at a disadvantage. The interior hose provided in many buildings will not stand the pressure on the lower floors provided by the tank on the roof. I think separate standpipes half way up the building should be provided. Ordinary cotton hose on lower floors will often burst from the undue pressure from the standpipe running up to the roof.

The subject of size of the standpipe is also important. In the Home Insurance Building in New York City there were three fires on three floors at one time, and the standpipe was inadequate to handle that condition.

A new source of danger is in the use of wireless on the roof. I was shown where a fire had started in the Waldorf Astoria because of this.

MR. JAMES BOYD (Philadelphia): I have not heard anything said this afternoon about protection of hose and equipment. I think that important, especially in office buildings. The gentleman who spoke last touched on this, saying that water going into cotton hose at a high pressure would burst it. That will occur also in linen hose. Where hose is kept wet it mildews and rots, so that it will stand 500 or 600 pounds at the nozzle, but it will not stand 25 pounds further along. In many stores hose is left in the rack year after year and when there is fire it is discovered to be useless.

Also, the water in fire pails is allowed to evaporate. Extinguishers are often tampered with in these buildings and if not inspected occasionally are valueless. I think it is important, as Mr. Newburn said, that the equipment should not be installed and allowed to take care of itself.

MR. LACOUNT: With reference to what Mr. Porter said at the opening of the discussion, his remarks were rather unfavorable to the large hose. You remember he said that they ran the hose out and pointed it at something, and then ran back with it. That is a dry test, so-called, and that is where the hazard lies in using that sort of equipment. The fire drill should include the skilled using of equipment. We can lay hose and put the pressure on it and have the men know what it is to handle the hose under a good stream. I once saw two burly blacksmiths walking all around a mill yard trying to get control of the hose that looked like a serpent. They didn't know about laying the hose straight a few feet behind them.

MR. F. A. RAYMOND (New York): Speaking of the type of brigades and large hose, I remember visiting a southern city some time ago where they had a brigade, and I doubted whether it would amount to anything. It was composed of boys, nearly all negroes. I ask for an exhibition. In something less than a minute they had 300 feet of hose out, and handled it without any trouble at all. It shows that a little drill will enable men who otherwise would not accomplish much to obtain good results.

MR. BENJ. B. HATCH (Boston): Two features of fire alarm, or fire drill, work which come to our attention have been overlooked in the discussion. One is the tendency for a foreman or owner; or, as in the case of the department I represent, the schoolmaster; to be the whole thing; that is, he declines to let anyone else know how to give an alarm. We have a good school house system in Boston and are handicapped in that way. Instead of every instructor knowing how to give an alarm there is only one man, and that is the master. Under the old system of using bells it was necessary to hunt up the master because his office was locked and the push buttons locked, and there was no access to these. Now the stations are located, one or two or more, on every corridor; and are accessible to everyone in the building; yet there is that same disposition to withhold that knowledge from all except one or two persons. That is one of the evils I want to mention here as a hint in factory or store or any other kind of protection, and it should be well understood by everyone.

I want to emphasize the point brought out about the importance of giving the alarm first, and not trying to fight the fire until it is too late and then sending in an alarm to the central fire station.

Another thing to condemn especially is the desire for individual control of the apparatus. I think it a great mistake to entrust the operation of the fire control apparatus to one person. All the employees of the house should understand how it use it.

MR. BARSTOW (Rochester): One of the contributing causes of loss of life in the Binghamton fire was that the girls had had a form of fire drill, and someone failed to impress on them the fact that a fire drill was of equal importance to the actual fire alarm. In other words, instead of the drill contributing to their safety to some degree it hindered it. They thought it a joke. I have seen drills where the employees came out as if on a holiday. Of course no one wants a panic, but there seems to be a growing tendency to allow lack of seriousness in exit drills. Next, there was a reluctance on the part of the Binghamton girls to come out on the street in their factory costumes.

MR. GASSER (Newark): The Binghamton fire has been mentioned and several references made to the Newark fire of three years ago. I will tell you something you have not read in the records of that Newark fire, in which 26 girls lost their lives. The loss of life was due to the knowledge of a man who knew how to put out a fire. The fire was on the third floor and he sent back 100 feet to the rear for ashes. The engineer asked: "What is the matter upstairs?" The reply was, "There is a fire." He said: "Well, if the ashes you carried up before didn't put it out, the chances are these won't." He went upstairs himself, and then it was too late to be of any service. The fault there was not of building construction. There had been one fire a year in that building for ten years, on the average, and none amounted to more than $10 or $15. There was a fire house across the street. There was no reason for the loss of a single life. It was due to the idea of a man who thought he knew how to put out a fire. I speak forcibly on this subject. Everybody should be encouraged to notify the fire department, and, while waiting, try to put out the fire. We have had placards printed with instructions how to send in an alarm, and the location of the nearest fire alarm box.

MR. HOLT (Chicago): We have had experience in office buildings with a heavy hose and in many instances have put in 1¼-inch hose in place of it.

MR. PORTER (New York): This question of the fire drill, and taking people out of the building, is uppermost in people's minds at the present day, and I am wondering how long it will last. But we feel that it will not last very long, when we have a fire drill which causes loss of time, not only to the employees on piecework but on the part of the company itself. The employees leave the building—many are not strong and some of them are fat or have physical disorders which are affected seriously in their exit. When they go down several flights of stairs under excitement and are brought back there is considerable time before they are again efficient in their work. It occasions loss of time to employee and employer. You will find that after the novelty wears off on the part of both we will have to work more and more away from the fire drill and rely on good building construction.

Mr. Evans: If there is no more discussion I will now read again the tentative resolution. (Reads.)

It was moved by Mr. Stewart and seconded by Mr. Guerin that the resolution be adopted as read. On motion, unanimously passed.

Resolution Adopted on Topic 5

"It is the sense of this Convention that:

(a) Every building—for its own safety and that of its contents in life and property—should be fitted reasonably, with respect to its location, character and use, with proper mechanical aids to discover, alarm and extinguish fire and to resist lightning; and

(b) The occupants of every building should be reasonably educated regarding the physical structure thereof, and how to leave same in a quick and orderly manner, and be organized reasonably to fight fire therein."

Topic 6—"Protection (Public)"

NOTE.—*Communal* fire protection is essential in addition to all like private *unit* agencies, hence this topic in this place.

MR. EVANS: Our next subject is Topic 6 under the tentative resolution announced. The first paper is on general public protection of cities, by Mr. Raymond.

"THE DEFICIENCIES AND NEEDS OF THE FIRE PROTECTION FACILITIES OF AMERICAN CITIES, AS BROUGHT OUT BY THE WORK OF THE NATIONAL BOARD OF FIRE UNDERWRITERS"

By Mr. F. A. Raymond, Engineer of the Fire Prevention Committee of the National Board of Fire Underwriters of New York City

This paper is brief. I did not have time to argue the matters very much, but simply state the conclusions that I and some other engineers have reached in investigating water works and fire departments throughout the country.

In stating the fundamental requirements for good fire protection we are listing also the features in respect to some in which most of our municipalities are weak. There are some well-governed and long-established communities with whose fire protection little fault can be found; and the progress in recent years, even in those cities where little attention has in the past been given to this matter, is encouraging.

Water Supply.—This should be under experienced engineering supervision, free from political domination and have adequate financial support. Supply works should be adequate and reliable; consumption controlled by the elimination of waste; pressures high enough to serve sprinkler equipments and furnish effective direct hydrant streams; and the distribution system should have adequate feeder mains and completely gridironed minor distributers, sufficient gate valves to give good control in case of breaks, and hydrants of such size and so located as to permit an efficient concentration of fire streams.

As affecting these features, it is necessary to have ample storage, preferably in elevated reservoirs, sufficient to insure fire flow at times of maximum domestic consumption, where supply is from wells or streams of relatively small capacity; fireproof pumping station and appurtenances; sufficient pumps and boilers to furnish required capacity with one or two out of service; steam, suction and discharge piping so arranged as to not affect more than one unit in case of a break; and force mains in two or more lines, with intakes in duplicate or so located as not to be affected by adverse conditions.

The minimum size of mains used should be 6 inches in residential districts and 8 inches in mercantile and manufacturing districts, and larger sizes should be used unless the gridiron is good and the main feeders fairly frequent.

Gate valves should be spaced so that not more than 500 and 800 feet respectively of pipe in mercantile and residential districts would be affected by a break; and hydrants with 6-inch gated connection to mains should be so spaced as to give one hydrant to each 40,000 to 50,000 square feet in high-value districts and to each 100,000 to 120,000 square feet in residential districts. These are necessary for adequate service.

Complete and accurate plans, systematic and thorough tests, inspections of hydrants and gate valves, and complete records covering operation, are essential to an up-to-date system.

Fire Department.—Full-paid men are far more efficient than a larger number of volunteers or call men. Even in towns of less than 20,000 the expense of a few full-paid men as drivers and engineers, with call men for the remaining members, is justified. Volunteers have done valuable work, but their efforts are too undisciplined and inefficient to make their assistance reliable. Furthermore, they are in reality more expensive for equal protection than paid men, owing to the loss of time from their regular avocations, the not inconsiderable sums raised by public subscriptions, balls, entertainments, etc., the unnecessary fire losses due to inefficiency of operations, and the unavoidable waste due to divided and irresponsible control of finances.

For control of the department, a single commissioner, responsible directly to the mayor or the electorate, is unquestionably more effective than a council committee or a multiple board of commissioners. The commissioner usually handles finances and makes appointments and promotions, and this plan works well when these functions are guarded by civil service laws. Often appointments and promotions may be safely entrusted to the fire chief; and in any case he should control assignments and transfers in the uniformed force. Tenure of office is necessary, because, where men are subject to appointment for a stated period, political or personal influences inevitably creep in. In large cities the chief cannot know all his subordinates or many of the applicants for appointment, so that the civil service method is the most satisfactory, but must be properly applied. Even in the smaller cities, say up to 50,000 population, where the chief may select his subordinates, some mental examination, and always a rigid physical examination, is desirable. New appointees should be on probation for about six months. For promotion, good record and seniority should be considered, but examinations for company officers should be largely competitive. For retirement, 62 years, the retirement age of the Army and Navy, is considered the proper period, except in the case of some higher officers; and pensions should be provided for members and dependents of deceased members. There should be a minimum age for voluntary retirement on pension, so that the department may not lose the services of able-bodied, experienced men.

Matters of discipline should ordinarily be entrusted to the chief, especially in the smaller departments where he is familiar with the men. If the chief is required to maintain discipline it follows he must have powers of enforcement, even to the discharge of offenders. If there be a single commissioner, appeals to him may be allowed in cases involving loss of pay or discharge, but otherwise the chief's decision should be final.

Drills are necessary. Those for new men should include practice with scaling ladders, life belts, ropes and nets on a tower, life saving, use of all tools and appliances, quick handling of hose and instructions in inspection and fire prevention work. All members should have occasional practice in quick coupling, scaling and life saving. Companies should be drilled regularly, and all appliances examined and kept in condition. Candidates for stoker or engineer should be examined in the care and use of engines under heavy working conditions. Engines should be tested yearly and after repairs, working at full capacity.

Fire departments are generally undermanned for effective work, especially during meal hours and in vacation time. For mercantile and manufacturing districts, at least 7 men should be present at all times in each engine and ladder company, and 5 men in other districts. For hose companies the number should be 5 and 3 respectively. With a motor pump one man may be omitted in engine companies. In some departments the obviously poor practice has crept in of letting drivers stay with the horses while the few hosemen struggle with the hose. Two officers should be assigned to each company, with one on duty at all times.

The two-platoon system, now in operation in several cities, decreases the effective strength at night and requires an increased total number of men to give equal efficiency during the day; and since the force is at all times at a minimum, no men are available for inspection or fire prevention work.

Some of the larger cities have separate fire prevention bureaus, but in the average city this work must be performed by the uniformed fire force; and even where cities have separate bureaus inspections by company members are valuable to familiarize them with the buildings in their districts.

Records should be complete and kept up to date; and annual reports giving summaries of these, with recommendations for improvements, should be issued.

For horse-drawn apparatus, an engine and hose wagon should be within half a mile of any point in mercantile or high-value districts and within one mile of any closely built residential districts; and a ladder company should be within three-quarters of a mile of any point in a high-value district and within a mile and a half of any point in closely built residential districts. For motor apparatus, these limits may be extended on account of the greater speed, especially in outlying districts. An engine and hose car should be within three-quarters of a mile of any point in high-value districts and a mile and a half of any point in closely built residential districts; and for ladder trucks these distances should be one mile and two miles respectively. In mercantile districts the limiting feature will be the amount of apparatus which should respond to first alarms, as the horse-drawn engines due on first alarm should be within one mile of the center, while for motor apparatus one mile and a half is permissible.' Frequently stations are poorly located, or the companies are still in the old poorly arranged volunteer stations. The topography is often a governing feature. Where the town is on a steep side hill, or the surface is cut by deep valleys, an apparently irregular distribution becomes necessary. Chemical apparatus should be so distributed that at least two will answer all first alarms in high-value districts and one in other districts. The combination chemical and hose wagon is now generally used in place of separate chemical engines, departments now generally installing chemical tanks with nearly every company. Motor apparatus permits enough ladders to be carried on hose cars to give good ladder protection to outlying sections.

In practice—for cities from 30,000 to 300,000—it is found that the number of hose or engine companies should average about one more than 1 per 10,000 of population, depending somewhat on the relative size of the mercantile district. The number of ladder companies in proportion to hose companies will be 1 to 3 or 4, depending upon topography, etc.

With an ample supply of water at a minimum hydrant pressure of 75 pounds under fire flow the fire department may be kept on a direct hydrant stream basis, with a few engines for buildings over four stories high or sections at higher elevations. With low pressures, engines are necessary, thus greatly increasing the cost of maintenance. With the motor pump, which has practically superseded horse-drawn steamers except for the large sizes used in heavily congested districts, this extra expense is reduced, but still includes heavy items. Recent tests show that the motor pump has made great advances in reliability and durability. With motor pumps of 800 gallons and less there is generally provided a hose box, and some departments add a chemical tank; but this is desirable only where the pump is seldom used. For ordinary purposes, in a closely built district, the combination hose car with chemical tank and the motor pump with hose box, giving a large supply of hose and tools at every alarm, is the best arrangement yet devised.

Another development of motor apparatus is the centrally located auxiliary squad, arranged to be at full strength during meal hours of other companies, thus assisting otherwise undermanned companies. This arrangement is better than detailing men from company to company.

Appliances for handling large streams are often deficient. First in effectiveness is 3-inch hose, especially valuable in cities using direct hydrant streams to reduce the loss of pressure and to permit increased strength of fire stream. Deluge sets, turret nozzles, water towers and ladder pipes are also needed. Many necessary tools are often lacking, and salvage appliances are seldom provided. Much trouble has been experienced in recent years with hose. Modern methods permit reworking of old rubber and utilizing cheaper grades, and much burst hose has resulted. Through the inspection service of the Underwriters' Laboratories, Inc., assurance can now be had that hose has been constructed in strict accordance with good specifications. Many departments lack proper facilities for caring for wet hose, or send the wagons to a central tower to reload, leaving their districts vacant. Slanting rack rooms or hose towers should be provided for all stations.

Fire methods should be such as to reduce the water damage to a minimum; and the use of chemical apparatus is especially valuable to this end. Care should be taken to protect goods and furniture, and men should be detailed to cover or remove goods. Toward these methods, and to prevention of fires, well-managed fire departments largely direct their efforts.

Mr. Evans: The next paper will be on "High-pressure Fire Systems," by Mr. Reed.

"HIGH-PRESSURE FIRE SYSTEMS"

By Mr. James Reed, Jr., Assistant Director of Public Works, Philadelphia

It was my understanding that Mr. Raymond's paper would take up the general subject, that Mr. Pike would take up the electrical side, and other gentlemen would take up different points. I have confined myself to the high-pressure systems and have not attempted to describe, except in certain instances, anything particularly Philadelphian, although we had, I believe, the first system down town here.

The regular water main distribution system in the congested-value district in any city where the buildings exceed nine or ten stories in height should be supplemented with a separate high-pressure system for fire protection, unless unusually high pressure is found in the regular water department mains and this pressure is well maintained during the hours of maximum draft. The necessity for high-pressure mains in large manufacturing districts brings up a question upon which there is considerable difference of opinion. Here in Philadelphia, along the Schuylkill River (where we have many paper mills), pressure as high as 145 pounds is maintained in the regular water mains; but in the mill district in the northeastern section, where many large manufacturing plants are located, we have pressures ranging from 15 to 31 pounds only. Hence we find the high-pressure system spreading over the greater part of this mill district to give the protection which the regular water mains cannot afford. Whether it would have been more profitable to spend the money necessary to provide for increased pressure in the regular water mains, rather than put in this expensive high-pressure system, is a question upon which opinions differ.

A high-pressure system should be laid out by competent engineering talent, with the most careful consideration of the problem of protecting the areas entitled to it in the most efficient and reliable manner. This means that the municipal officials will coöperate with the insurance organizations, with the owners of the property to be protected, and will consult with officials of other cities having systems in successful operation, studying with care the essential details of these systems with a view to profiting by the experience of others, and adopting for their own use all that appears best in the systems installed to date while keeping local conditions in mind.

The installation of the system having been decided upon the questions which arise are:

(1) Where and what size mains shall be used and what kind of pipes run?

(2) Location and design of stations.

(3) Location, type and number of hydrants.

(4) Kind and number of pumps.

(5) The communication system.

(6) Provision for an adequate force for operation, maintenance and engineering requirements.

Under (1) location of mains, the probable future extensions must be considered, and this also has an important bearing upon the station design, equipment and location. Provision must be made, of course, for keeping the mains charged under pressure at all times; and, from the standpoint of minimizing leakage through pipes, joints, stuffing boxes, etc., it is desirable that this pressure should not be excessive.

In considering the question of the location of the pumping station, attention must be given to securing a constant, reliable water supply in excess of any probable future requirements, and in making sure of the maximum safety of the station as regards fire hazard. Referring to the building and its equipment, it should be of fire-resistant construction throughout with wireglass windows, steel shutters and doors, and complete isolation of heating plant, fuel, oils, etc. Possibly the pumping station will have to be located in a district that is far from desirable from a fire-hazard standpoint, and in this case every precaution possible should be taken in the design and construction to insure the maximum security. We have had an example of that at our Delaware Avenue station, in the wholesale district on the water front, where we had a small fire in a peanut factory next door to it, but the plant continued in operation.

Good lighting and ventilation under all operating conditions, ease of access for repairs to equipment and the best of station facilities therefor, proper quarters for crew, adequate provision for future extensions, are all problems to be solved. The building should be dignified but designed for economical construction. There should be two independent systems of lighting and one master switch should control all lights on the pump floor for instantaneous lighting.

The pumping equipment may be steam, electric or gas-driven. Some of the arguments for and against the different types are as follows:

The electric requires less space for installation and operation, can be started very quickly, is cleaner, and the first cost is probably lower.

Steam requires large units for greatest economy in first cost, as well as in operation; boilers must be provided and steam pressure maintained constantly; a coal supply is needed and proper station ventilation and cleanliness are harder to maintain. Where the steam output of the station can be constantly applied to a municipal heat or light load, as in Baltimore, we have a maximum of efficiency from the steam-driven pumping installation.

The gas-driven type is slower in starting; cannot well be fitted with distant control for starting and stopping; is noisy, and for the same capacity takes more space. It can be economically installed in a large number of units and economically operated, as fuel is used only when actually in service.

Whatever type is installed consideration should be given to the units that they be sufficient in number, so that the disabling of one or two units at the same time will not dangerously reduce the station output.

The power mains to pumps should be in duplicate, as should the discharge pipes, and these so gated that any pump can discharge into either pipe; all controls should be brought to one central point and proper gauges and meters fitted. Control should be installed in duplicate, each acting independently of the other.

Various kinds of pipe have been used, from the ordinary bell and spigot, deep socket with lead-caulked joint, to the bolted universal type with machined joint, or the bolted flange with expansion joint. Some cities prefer steel to cast iron, in spite of greater cost and increased difficulty of satisfactory manufacture. The pipes should be carefully tested at the foundry at 1000 pounds pressure and inspected for any physical defects. They should be numbered and their location noted at time of laying.

Note.—There has been a difference of opinion as to the pressure to be tested. I have set it at 1000 pounds. We have set 800 here. I understand some cities require 2000.

After laying, the line should be tested by squares before back-filling trench to at least 400 pounds pressure, maintained for two hours. Mains should range from 8-inch up to the maximum required, 18 to 24-inch, say, basing the size on the future requirements of the district. In the congested-value district pipes and hydrants should be of a size capable of delivering the total station capacity to one square. Air valves should be installed at high points on the mains in order to keep them free from air accumulations. Where practicable, hydrant connections should be placed at the high points on mains to take the place of air valves.

Mains should be so gated that any shutoff on account of a leaky or blown-out section will not put more than two hydrants out of service. The type of valve to be used should be decided by the requirement that it must be simple, rapid, strongly built and easy of operation and repair, and well protected from damage.

Every hydrant should be equipped with a valve on the hydrant connection as near the main as possible, so that repairs can be made to the hydrant or its connection without shutting down the main.

A sidewalk location, as in Baltimore, with the use of a detachable header, giving positive pressure control at the fire ground, offers advantages not possessed by the regular hydrant installation, with mechanical or telephonic communication with the station for pressure control. In cities with a more northerly situation and severe winters, with heavy snowfall, the locating of the riser and the coupling of the header may offer difficulties to speed in going into service; but there is, on the other hand, the freezing danger in the hydrant type which is always present in spite of automatic drainage attachments.

In order to prevent hydrants from freezing in severe cold spells, frequent inspections should be made to see that the barrel has not filled through a leaky valve and a clogged waste pipe.

Hydrants should be located on diagonally opposite corners and in long blocks at midway points.

Means of prompt and efficient communication with the station from the fire ground should be provided. This may be effected by electric signaling system or by telephone, or in some cases by both, as in Cleveland. Street telephone boxes should be located close to hydrants, should be simple in design and afford direct communication with the engineer in charge of the station. They should be located not more than one block apart in the congested district.

The force should consist of a competent superintendent of the system, who should be a qualified engineer, under whose charge the operation and maintenance should be placed. Design and construction in connection with new work may be under his charge or under a specially selected engineer; but in any case this work should be handled by a separate engineering force under his direction. Each station should have an efficient chief engineer with sufficient crews to operate properly all units at one time. Each district should have a proper repair force, under a foreman, to do the regular testing, repair and maintenance work necessary to all lines and connections. There should be an emergency force constantly on duty, consisting of two stopmen and a chauffeur with a light motor truck to transport them and their tools to any point on the system, to make shutoffs in case of necessity. Under the system as operated here in Philadelphia these stopmen respond to every fire alarm in the high-pressure district, one man taking his post at the street telephone box for transmitting orders to station, the others manning the hydrants. Their trucks can be used to advantage for transporting the regular repair forces from point to point on the system during working hours, keeping in touch meanwhile with the station through the street boxes.

The system should be tested at frequent regular intervals; hydrants, valves, valve chambers, etc., gone over; and careful records kept of all work done and of the performance of all parts. Included in the above is, of course, the keeping of a proper station log, daily automatic pressure records, observation of basin water level (where basin supply is used), loss of head or basin level in 24 hours, etc. Note should always be made after a fire service that hydrants were left in good working order. Convenient-sized portable plans of system, showing hydrants, stops and boxes, should be carried by the emergency truck; and a large plan should be available in the crew's quarters showing the whole system, and, by means of colored pins, whether any stops are down or hydrants or boxes are out of commission. Where there are two or more districts, each supplied by a separate station, steps should be taken to insure prompt manipulation of the dividing stops and putting the other station into service immediately in case of necessity.

Finally let me emphasize the value of a high-pressure system not only as a means of fire protection when chemicals, private installations and steamers are insufficient to cope with the situation, but as an adjunct to these, and to be used, at moderate pressures, on first alarms wherever steamers are called into service. By this I do not claim that its installation means the withdrawal of the apparatus formerly used in the district.

I would like to say, in conclusion, that if there is anybody here interested in seeing our high-pressure stations it would give me great pleasure to place a car at their disposal so they may see how our apparatus is operated.

MR. EVANS: We will now hear a paper on "The Fire-Alarm System (Public)," by Mr. Pike.

"THE WORK OF ELECTRICAL BUREAUS IN FIRE PROTECTION"

By Mr. Clayton W. Pike, Chief of the Electrical Bureau, Philadelphia

Time does not permit me to more than mention the fire prevention work of municipal electrical bureaus, comprised in their supervision over electrical equipments, which in the streets alone of Philadelphia reach the tremendous total of 83,000 poles and 19,000 miles of wire. Their life and fire hazard is considerable and it is increasing yearly:—first, because it is increasing in amount; second, because the lighting companies are extending their high potential circuits; third, because they are not content with the pressures commonly used of 6600 volts (which pressure is as high as we should, in general, allow overhead on our city streets), but which they want to increase to 13,000 volts. I will proceed then to the fire-fighting functions of an electrical bureau.

First we have the Police Patrol Telephone and Telegraph System, by which partolmen from boxes located at frequent intervals on the streets can communicate an alarm of fire to their house sergeants, and the sergeants with the Bureau of Police or with the Electrical Bureau; likewise, the special telephone system instruments located at points along the high-pressure pipe lines which permit communication to City Hall or to the high-pressure pumping stations. Neither of these, however, can be used except by a person having a key.

I pass on next to the most important agency of all, the fire alarm system. The purpose of a fire alarm system is to notify the fire-fighting force quickly and accurately that there is a fire at or near a certain place. Without such a system, and a good one, the best water supply or the most efficient fire-fighting force is of little value. It is, therefore, probably needless to say that its central office should be in a fireproof building not menaced by other structures; that the surroundings of its equipment should be as free from combustible material as possible; and that its force should not smoke while on duty. The principle of duplication in its apparatus and parts must be carried to a great extent so as to provide against even remote contingencies.

Such a system consists of signal boxes located at strategic points on the streets, which, when operated by pulling a lever, send an electric code signal over a series circuit, either overhead or underground, to a central office which contains proper apparatus for receiving and recording this signal. This signal is in turn sent out over a similar circuit to the various stations of the fire-fighting force, which should be equipped with similar receiving apparatus.

While fire alarms can be and are transmitted through telephone exchanges, the fire alarm telegraph system is vastly less subject to error and is a much quicker means; ***provided enough street boxes are installed,*** and ***provided further that these are not locked*** but can be operated by any one in case of fire.

BOXES

The number of boxes per square mile should be at least 150 in congested-value districts; 75 in the high-value manufacturing districts, and 16 elsewhere. Boxes should be so designed that if two are pulled simultaneously, one will wait for the other and the signals of both will be received at the central office; so constructed that any one can operate them without delay and without danger; and so speeded as to send the signal as fast as the central station apparatus can receive it with certainty. They should be strategically located in a prominent situation, and their presence indicated by a red light at night.

CIRCUITS

Certainly not over 40 boxes should be connected to one circuit, and circuits should be interlaced so that trouble on one will not leave any section without protection.

To provide against failure, signals should be sent to fire stations over two different circuits, and not more than five stations should be connected on any one circuit.

As many of the circuits should be underground as financial considerations will permit. Philadelphia's records show that overhead circuit troubles cause boxes to be out of service ten times as many hours as do underground circuit troubles. The box circuits, and at least one of the circuits to fire houses, etc., should be operated on the closed circuit method.

SOURCE OF ENERGY

1. Each circuit may have a storage battery with a duplicate set to be used while it is being charged, as in Philadelphia.
2. Or it may have a motor generator, in which case there must be provided extra motor generators with a switchboard arrangement, so that in case of trouble any generator can be at once replaced, as in Chicago.
3. Or all the circuits may be connected in multiple to a large storage battery or motor generator which should, of course, be provided with a duplicate, as in Baltimore.

RECEIVING APPARATUS

At the central office there should be connected in series with each street box circuit a bell whose taps will correspond to the number of the street box when the latter is pulled; and a tape register to verify the signal should also be installed, which register may be in series or connected through a relay. Both bell and register should be capable of operating quickly, say five strokes per second. In the fire houses, etc., similar apparatus should be used, there being no need for perpetuating the common ponderous and slow-acting gongs.

SENDING APPARATUS

Signals can be sent out by an ordinary Morse key, as in Chicago; or the incoming signal due to the pulling of a street box can be made to set an electro-magnetic device in motion which will automatically send it over the circuits to the fire houses, a practice very suitable for the smaller cities. Most large cities use a transmitter operated manually instead of automatically. With all methods, provision must be made for another sending device in case the usual one is out of order.

OPERATION

A high-grade and skilled personnel is essential. In no other municipal work is political subserviency, with its certain accompaniment of carelessness and inefficiency, liable to be so costly. Operators must be ample to meet emergencies even though they are idle much of the time. For example, two or even three operators should always be on duty at the central office.

A system of suitable daily records covering important and controlling information, entered on monthly tabulation sheets, is an essential to the maintenance of a high standard.

CONSTRUCTION

Rubber-insulated lead-encased cables, carried underground in vitrified clay ducts, laid on three inches of concrete with proper manholes, form the ideal construction; but creosoted wood ducts and paper-insulated cables answer well at much less cost, and thus allow a larger percentage of the construction to be placed underground. Overhead construction should be, of course, on separate poles; but when financial considerations prevent this practice, the wires should be carried on the poles of the telephone and telegraph companies rather than on the high-tension lines of electric light and power companies. Connections between overhead and underground are made on cable poles in suitable boxes containing fuses and lightning arresters, if the latter are employed.

Circuits coming into stations should be protected by a fuse or circuit-breaker, by a lightning-arrester and by a heat coil, all properly mounted on non-combustible material.

MAINTENANCE

Testing must go on all the time, not merely to find troubles already existing but to catch any case of deterioration in lines, cables or apparatus, so as to permit remedy before actual breakdown, if possible.

Street boxes should be tested monthly (specially important boxes, as in theaters, are tested weekly in Philadelphia). Circuits should be tested for insulation several times daily (Philadelphia does it every two hours). Any portions of the system working on the open circuit method must be frequently tested.

In case of actual trouble, the utmost speed must be used to make temporary repairs. In this work minutes or even seconds saved may be precious. "Trouble" men must be kept on duty day and night, and one or more automobiles provided for their use, motorcycles being too dangerous. In stormy times the regular day construction gangs must be pressed into service. (The storm of August 27, 1913, played such havoc with wires that we used 25 men in making only temporary repairs.)

The above standards represent an ideal reached by few if any cities, and for many cities are hopeless of early realization. But when the public really understands how vital the fire alarm system is to its fire protection, then shall we see these standards fully equaled and in many respects they will undoubtedly be excelled.

MR. EVANS: I will now ask Mr. John W. Kelly, Jr., Chief of the Electrical Bureau of Camden, N. J., and President of the International Association of Municipal Electricians, to follow with some remarks on Mr. Pike's paper.

MR. KELLY: I will venture to criticise Mr. Pike's paper in one or two points. First, in the number of boxes on a circuit. I consider 40 too many, the underwriters' standard being 20. The answer to that, I imagine, would be that it is a question of expense; that not all cities can afford to have circuits enough to cut down the number of boxes on each. But you are introducing too many points of danger when you go much above 20. We have an arrangement in Camden by which 28 boxes can be used on a circuit. We don't lose on that particular circuit—we can't lose more than eight boxes at a time. The man in charge, immediately a circuit opens, tests and isolates the circuit that is in trouble, leaving the three other loops on that circuit open.

As to the question of construction, the use of fibroid conduits will prevent to a great extent electrolysis, and in that way save an immense amount of trouble. The larger cities should require in addition to the fire alarm system an auxiliary system, connecting the larger plants with the regular system direct, in order to save the latter. The auxiliary system is practically an added arm, reaching from the different floors of the factory to the city fire department.

Another point which I think would be of interest to the electrical bureau is the question of instruction to the police department as to the proper method of sending in fire alarms. You would be astonished to find out the large number of policemen who do not know how to send in an alarm. I know what I am talking about. I have been asked to instruct some of them. Some think all that is necessary is to break the glass and the alarm goes in. I found it well to instruct the policemen in our city exactly what to do in sending in an alarm, and what should happen, so they will understand that in opening a box and pulling the alarm the bell should immediately begin to tap, and if not at first, they should pull the lever again. In the last seven years we had only one box stop on us.

I will now call attention to the practical use of the telephone for fire alarm. This question has been discussed at the Convention of the Municipal Electricians, and it seemed to be the consensus of opinion that the telephone is an exceedingly poor fire alarm service. There are too many streets in our city whose names are so near alike—such as Lime, Vine, Pine—and the party giving the alarm is always excited, and hence it is hard to hear correctly and certainly what any one is trying to tell over the telephone. Numerous cases are on record of lives lost owing to misunderstood fire alarms.

Another point to be considered in telephone fire alarms is the personal equation. I know of one instance in which the alarm was sent in from Ninth and Pine. The fire headquarters man sent in the alarm as from Ninth and Lawrence. It doesn't sound much alike but he said that was the way he heard it. If you want to send in a certain alarm, pull the box and it will do the rest. I have found in a large number of cases that where you find a city where there is an undue percentage of alarms by telephone there is something wrong with the box system. They are not enough, or are poorly arranged, or people don't know how to use them for sending in an alarm.

After pictures and instructions were sent out in Newark last year there were more box alarms than Philadelphia had—890 box alarms and only 241 by telephone—while Philadelphia had 749 box alarms and 2895 by telephone.

MR. EVANS: In all of these larger questions there is a field of effort to suppress dangerous things as well as to produce good things in control. For instance, in "private protection" there was the question of the gas being shut off. In "public protection" we have here the only appropriate place to bring up a matter that needs attention, viz: stray currents due to leakage, known under the general name of "electrolytic action." We have with us Dr. Frank A. Wolff, of the Bureau of Standards, Washington, whom I will ask to make a statement in this connection.

DR. WOLFF: I didn't expect to be called upon. Mr. Baldwin and myself have not been engaged in this particular line of work, but one of our colleagues, Mr. McCallum, working under Dr. Rosà, has particularly developed that line. We have not investigated the subject of electrolysis from the standpoint of the fire hazard but from the standpoint of the property hazard.

All the large cities which use the single trolley with ground return are troubled to a greater or less extent with electrolysis. These troubles, in general, have been increasing, due to the fact that the speeds of electric cars have been increasing, the size of the cars, and the number of cars, and the amount of power. At the same time the recognition of the trouble has led the various companies interested—the gas companies and telephone companies and car companies as well as the railroad companies—to look into the matter more thoroughly.

Quite a number of electrolytic surveys have been made, the result of which have shown the enormous and accumulating damage which has been going on. Now the Bureau of Standards has undertaken, with the help that Congress has granted, to investigate the principles of electrolysis, to find if possible the method of remedying the troubles in the most economical way. Particular attention has been paid to different kinds of construction. Under certain conditions even reinforced concrete may be ruptured. Our work has been conducted in the laboratory and also in the field. We have taken quite a number of typical cases in large cities like St. Louis, representing the first-class city, and also in those of the second class and in those much smaller. A very extensive survey was made of one of these cases and it was found that the remedy lay in the use of insulated return feeders. This is the remedy from the standpoint of the railroad company. In the one particular case in which this remedy was applied—that of a large system—it was found that the application of the insulated return feeder effected economies in operation that would more than pay for the interest and depreciation on the added investment on the insulated return feeder system.

The method was applied to part of this system and the claims made were fully substantiated. In the installation it was arranged that the return system could at the same time be grounded from point to point so as to give the advantage of the ordinary grounded return. The efficiency of the grounded return was only 15 per cent. of that of the insulated return.

With regard to the electrolysis question from the standpoint of fire hazard, it might be said that if the wires are properly grounded and, in addition, an insulated feeder return built, voltages would be so low that no trouble due to electrolysis may be expected from igniting gas mixtures produced from leaky gas mains.

One other point mentioned was the question of the electrolysis danger of grounded lightning protection systems. There need be no fear of that at all. The lightning rod is simply grounded at one end. There is no return circuit, and therefore there can be no danger of electrolysis unless some grounded circuit makes contact with the lightning protected system. That also applies to grounding in general of lightning protective devices.

Mr. Evans: The feature which seems most apposite to our field of investigation here was the apparent possibilities of destruction of reinforced concrete buildings, and there should be public knowledge about the fact that this danger exists. Later investigation will measure the danger and show how correctives can be applied. It is now in order to give you the following brief review of the "Management" phase of Public Fire Protection which embodies the joint view of Mr. J. S. Mallory, Fire Marshal of Philadelphia, and myself, and is the result of our joint work in this connection in this city.

"PUBLIC FIRE PROTECTION" MANAGEMENT

By Messrs. Powell Evans and J. S. Mallory

(*See Appendix 3, page 381, for details.*)

Fire departments, as a rule, all over the country, up to this time, have been selected and managed too much on old "rule of thumb" lines, and not sufficiently instructed in and brought up to modern methods. Perhaps when the public pays this important body of their employees as well as it pays the police, and demands better service, it will get it. After emphasizing the need of fire-fighting schools, we pass on to our particular subject—the use of active firemen for fire-prevention purposes; which provides better occupation for the men, familiarizes them with the property under their control, and enables them to perform their hard duty in emergencies with greater speed and safety than otherwise. The system has been employed in a few cities as long as fifteen years and is rapidly spreading. It has worked to advantage wherever used.

In New York the Bureau of Fire Prevention uses 65 inspectors. The tenement houses, however, are inspected by the tenement house department.

Chicago uses in its fire inspection service 150 captains, lieutenants and men eligible to promotion. Inspectors follow up reports to assure compliance. The bureau, although recent, has fire squads and drills in 150 large factories and over 300 schools.

Boston inspects through 15 districts, subdivided into subdistricts, the bulk being residences; but this is not required by law, hence it is measurably ineffective.

Kansas City has 4 fire wardens in the active fire prevention movement. Rochester has 4 battalion chiefs in 4 districts, each with 2 captains; also 2 captains assigned to each side of the city every six months, who have no authority but submit reports to the Commissioner of Public Safety. The fire loss was reduced about four years ago to below $400,000, but this year it has apparently gone up again and is supposed to run about $500,000, this increase being largely due to some unfortunate lumber fires, as we understand it.

Cincinnati has used active firemen for inspection work since July 1, 1912. One or two men from every company inspect when they can be spared within the special hydrant districts. Up to February, 1913, over half the buildings had been inspected—more than 40,000 buildings—with excellent results.

In Jersey City captains cover residential districts once a month. Members of the fire departments make inspections, issue prompt orders and have prompt compliance, and achieve good results.

Columbus has had inspections by the active fire departments since 1897.

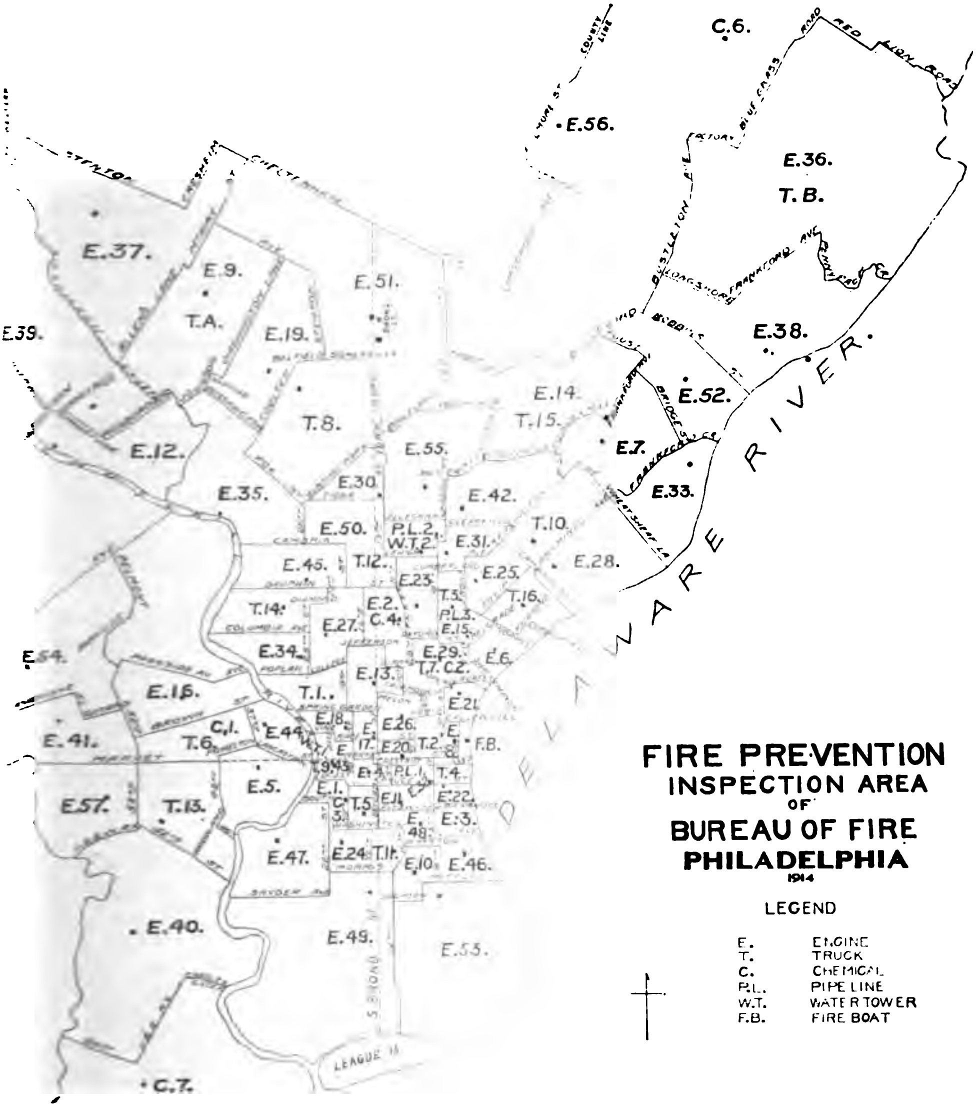
Lansing, Michigan, started fire department inspection 10 years ago. Captains inspect bimonthly, but under the State Fire Marshal law.

Superior, Wisconsin, has inspected for the past two years. The fires in 1904 were 145; in 1910, 320; in 1911, when they had begun a few fire inspections, the fires numbered 269; in 1912 they numbered

254. The regular firemen, one from each company, inspect with good results.

Wilkes-Barre, Pa., has materially lessened fires by inspection.

In Youngstown, Ohio, a few years ago fires cost over $4 per capita, and now they cost only 40 cents.



We investigated the details of all these systems, in practice and the forms of reports employed, by correspondence (which has been in progress for nearly a year), before reaching any final plan of action here.

The Philadelphia Fire Prevention Commission first laid out a thoroughly detailed plan of the functions of the city government controlling and influencing the local fire hazard. We had discovered that these various other communities had achieved good results by pursuing a preventive policy, and the question with us was, "Who would inspect here and where could we get the money (as the city at present is poor)?" The answer was necessarily that we must use employees who were already engaged and paid. The first step was directed to a listing of the fire companies.

There are 83 engine, truck and chemical companies in the city, which are enumerated on the map shown. Up to the time we worked out this control there were no definitive lines and no firemen's inspections. These facts were all incorporated in a master map giving us a *geographical* layout of the city. Then we made a *time* map from the payrolls of the men employed, with the total time. Then we separated this total time into (1) "days off," (2) "days spent on special details," (3) "time for miscellaneous details," (4) "average time for sickness and injury," (5) "absences and vacations," and (6) "minimum time required to man properly each of these companies." The residue was the *available* time, based on explicit requirements of the necessity of the case for *inspection service*. This residue was available in addition to anything we could save; for instance, the time formerly required by the theaters. When we came down to the net available time we found it averaged from 10 to 20 per cent., and then we applied to the mayor for authorization for its use. He agreed with our theory and assigned us up to 10 per cent. of the men—one man in each of the 83 companies.

We started with 6 men and sent them to New York for a week in their fire school; and then brought them back here and started them in active work in the congested part of the city. We turned each man into a teacher for other men with all speed possible. We then investigated forms of reports, and the things we wanted to do, and evolved for our particular needs here the report blanks needed. One point worked out with care from the beginning was the importance of instant and complete publicity with respect to all of this inspection work. Our active firemen, under the authority of a law as strong as the City Fire Marshal Law of New York City, can enter any place of business, or house, any time, and use his judgment about combating dangerous fire hazard conditions. It is a large power and capable of large abuse. The best way to make abuse impossible is for the inspector to report promptly in detail his conclusions and to have a record of these conclusions sent—after check, review and endorsement by the fire marshal—to all parties concerned instantly. Our practice has been to fill in one of the smaller blanks in duplicate and leave one with the owner or occupant or bailee of each property when inspected, which tells him what he must do at once. For instance: if coal is in a wooden box near a wooden partition; if buckets are empty, or filled with gasoline instead of water (as we have found here); this memorandum left with the owner calls for instant correction. The duplicate left with the fire marshal serves as a basis (with other notes) for filling out the larger record blank in triplicate (1 copy for property, 1 copy for inspection company, and 1 copy for the fire marshal). We now have each of these 75 men working through a definite area all the time. We return each inspector after a long enough period to become familiar with his duties, back to his house and send out another man and train him; so that we have on an average three men per company familiar with this work. We don't take drivers or enginemen for this purpose. We find the average man can inspect with reasonable care from five to eight buildings per day in the central part of the city, which has resulted, up to this month, in the inspection of 22,000 buildings in our congested districts and the correction of 60,000 odd details to combat the fire hazard. Rotation in service, according to the accepted practice of the Mutual Insurance Inspection System, is important to counteract the effect of habit and association.

We tried to teach these men the value of this work; at the beginning—that is: first, that the work is not a fad or temporary, and to make it clear why this was so; second, to give instructions with care and without fear or favor, and that the department would stand behind their conclusions if on review they were found to be sound; third, to remember that they represented the city, and to be courteous, firm and patient and explain clearly their actions; fourth, to make friends of those in charge of the buildings, superintendents and janitors personally; and fifth, to decline any gift or anything that would give color to charges of graft of any sort, etc.

When we examined theaters in the Spring we found building after building where there were extinguishers which indicated that they had not been refilled with chemicals since 1910; accumulated rubbish, blocked and maimed exits, etc. Between the fire marshal's department and the Bureau of Building Inspection we forced those owners to improve conditions generally; and by the expenditure of approximately a quarter of a million dollars during the past summer, as a necessary precedent to the issuance of annual licenses, they did tremendously improve the whole proposition of playhouse safety all over the city.

We are trying to enlarge the experience and change the point of view of our firemen by lectures which we are gradually working out on such technical subjects as automatic alarm systems, automatic sprinkler systems, etc.

This is the substance of our reorganization of the fire department here with respect to the use of active firemen for inspection work, using the authority of the fire marshal's department. I had intended to read here in connection with the explanation of this work the remarks of Hon. Herman L. Ekern before the City Club of Chicago on Fire Prevention Day recently on October 9th, but as they are slightly more appropriate under the topic of "Management" you will hear them then—especially as we are a little behind time now. A study should be made of the different inspection services everywhere, whether State or municipal, to see if we cannot be of use to each other. We have four thousand police in this city, and a thousand firemen. Obviously the police are the first and best avenue for controlling fires on the spot. Somebody here recently threw a cigarette through a street grating and a policeman saw smoke issuing from it. He discovered that a fire had been started and thought he had put it out after throwing several buckets of water through the grating. He was mistaken, and caused a bad fire in that building. We called the attention of the police department to this and they immediately issued in their bulletin the following order:

DEPARTMENT OF PUBLIC SAFETY
BUREAU OF POLICE
General Order No. 77. *Phila., April* 15, 1913
In re—SLIGHT FIRES

I. Recently a patrolman discovered a fire in a grating-covered areaway in front of a building. He procured several buckets of water and apparently extinguished the flames. Later the fire broke out afresh and resulted in serious damage to the building and contents.

II. In the future, no matter how slight the fire may be, nor how positive you are that it is out, you will notify the captain in charge of the nearest fire station, who will send a detail of one or two firemen to investigate and make certain that the fire has been extinguished.

III. Don't take any chances with fires.

It is that sort of coöperative work (which does not cost anybody anything but a little push and brains) which is of great value in this preventive policy.

The details of work like this are almost endless.

Those of you who are fully interested can find in Appendix No. 3 of this Record the complete story of our Philadelphia efforts; and this may serve to light the way of some other communities now wandering in the hazy and circuitous ways of ancient red tape and inefficiency in this matter.

MR. EVANS: We will now take up the discussion on the range of the above papers submitted to you, which covers the whole subject of "Public Protection."

MR. F. H. WENTWORTH (Boston): For the purposes of the Record, I would like to emphasize one point touched on in Mr. Raymond's paper —standard hose couplings and hydrant fittings. There may be a few here who do not understand the anarchistic condition in this matter. Some time ago Cambridge couldn't come to the assistance of Boston; they couldn't couple their hose to the local hydrants. In Philadelphia you have snap couplings; in Atlantic City they have screw couplings; but one can imagine a fire in Atlantic City in which the Philadelphia companies could be very useful. I remember the National Fire Protection Association trying to standardize the hose couplings, and the need of giving attention to this matter in local communities should be emphasized in the Record of this Convention.

MR. PAUL MASON (Cincinnati, Ohio, and Covington, Ky.): I would like to emphasize what Mr. Wentworth said, and add one or two thoughts to it. I recently secured a compilation of the kinds of hose connection in use in the water works systems in the State of Ohio, and I believe there were in the neighborhood of something like fifty variations in the State of inside and outside diameters and other features. Two cities in the State use two sizes of non-standard thread, which might have put them in a bad way if a fire in one city or town had made it necessary that they call on the other for assistance. There are obvious ways of correcting this condition without replacing hose couplings of hydrants. Mr. Greenwald, of New York, has devised a system of recutting the 7-thread and 8-thread couplings so as to be interchangeable with 7½-thread couplings; and here in Philadelphia R. D. Wood & Company have devised a nozzle with standard thread on one side and non-standard thread on the other adaptable to couplings of almost any system. A good many cities of the country, especially the smaller towns, cannot afford to replace their couplings entirely and could use the latter device.

There is a phase of public protection not touched on here which also applies to private protection, and that is the necessity of ordinances. That would of course come up under legislation; but it has an intimate bearing on both forms of legislation we touched on this afternoon. In Covington, where I live, we had nothing but an ordinance passed in 1884 covering sprinkler equipment and public water supply. One thing we need is adequate legislation to provide for private protection. It was only after great difficulty we had the proper legislation for this. I think we should give consideration to this point.

MR. EVANS: I have a letter calling specific attention to the difficulty of getting private water companies to permit connections to static water supplies without almost prohibitive charges. They do not yet realize that these connections are economical in the end; not taking more water, but less, to extinguish fires when they occur.

MR. C. A. GASSER: The city of Newark has been making inspections since 1907, and we have a bureau of fire prevention which is part of the fire department under a State law. We send men out in uniform with a label, "Fire Prevention," in silver letters.

MR. EVANS: We have used the letters placed obviously on the coat in this city.

MR. W. H. JOYNES (Richmond, Va.): I didn't hear you read "Richmond, Va." We have been inspecting properties for a number of years. Our experience has been very satisfactory. We have adopted the scheme there not only with the engine houses, where the men should know the means of ingress and egress to properties in their areas, but with other stations.

MR. EVANS: This is more and more interesting to me because it shows that this experience has been running around this country for from ten to fifteen years, but we have been, until lately, unable to bring it to the light. This is one of the purposes of getting together—to learn what others have been doing and how to apply it.

Mr. Gorham Dana (Boston): With regard to the sprinkler connection, there are a great many cities where a charge is made. I think in a public department no charge should be made for this any more than for a hydrant. Where the water system is owned by a private corporation there should be a charge, and the basis commonly used is, to my mind, unfair. The common way is to base it on the number of sprinkler heads in the building at ten cents a head. It seems to me the charge for the sprinkler system connection should be on the size of the riser, and a desirable method would be to base the charge on the number of hydrants possible on that connection, a 3-inch supply being equivalent to one hydrant and 6-inch to two hydrants.

Mr. Evans: I am very glad to concur in Mr. Dana's thought, but he does not travel quite far enough for me. I think the charge should be based on the average number of heads to control the fire. I believe that is where we differ. I would also like to hear some discussion on a question not yet brought up in connection with sprinkler equipment. Here in Philadelphia we have a low pressure in the water supply mains. We have never, so far as I can find out, made connection for sprinkler systems to the high-pressure water mains. Are there any expressions of opinion about that? If not I will ask Mr. Richard H. Morris, who has taken great interest in that subject and is one of the mutual insurance engineers, to give us his thoughts on this point.

Mr. Morris (Philadelphia): I think almost everyone in the room, whether engineers or architects or insurance men or chiefs of fire departments, will agree with me as to the value of the automatic sprinkler as the *best means of safeguarding not only property but life;* and if you safeguard property in the community you certainly safeguard cities from conflagration.

We have talked a great deal about building standards, etc. When we build our new buildings of reinforced concrete or some non-burnable material we have not solved more than half the problem. We still have, in our large cities especially, some buildings a half century old. Some have been torn down, but there are enough left to be eyesores—conflagration-breeders—where a fire may start and have almost no ending. How can we best improve them? Perhaps by laws governing the closure of open flues, etc., and possibly controlling occupancy in congested portions of cities.

Yet it seems to me after all that the best solution boils right down to the automatic sprinkler. It requires, of course, plenty of water. In three of the largest cities of the country—New York, Chicago and Philadelphia—the domestic supply is not sufficient to afford a water supply for the sprinklers, and as a consequence, in those buildings that are sprinkled they have had to put up tanks which are moderate in size. In a new building it is a proposition requiring much care, but in an old building it is often impracticable from an engineering standpoint. In those cities I mentioned —New York, Philadelphia and Chicago—where in addition to the domestic system of pressure there is a high-pressure system with the pipes kept full of water (the pressure being increased to from 225 to 250 pounds when the system is thrown into use, 250 in Philadelphia and about the same in New York) it has appeared to me that with a practically inexhaustible supply and with good pumping capacity at the source, this water supply could be utilized with the sprinklers; and it would induce a large increase in the number of equipments in the congested portion of any city covered by such high-pressure system.

We have to-day developed control of water supplies by almost every conceivable sort of system. My thought now is that some system of valves on the curb line of each building could be devised in some shape to properly control the high-pressure service when applied to buildings. Such a plug ought at least to stand as well as the high-pressure plug does, so in case anything happened to the building the whole system would not be crippled. The objection is raised that you may not be able to get at such valves, as the fire might attain sufficient headway to prevent approach. But every high-pressure system has a controlling valve at each street corner; and with the sprinklers in service in the building it is almost inconceivable that a man cannot always get to the street control valve, and the additional safeguard of the corner valves makes it appear to me that this proposition is a reasonable solution.

Of course the mains could be cut out as far as one or two blocks in case of necessity. It seems to me that high-pressure systems should certainly be used to supply water to sprinkler equipments, and I think such practice would mean the extension of the sprinkler equipment to many buildings which cannot now support a tank. *The wide extension of the sprinkler equipment service has more value than any other one thing to control fire destruction.*

MR. GEO. M. ROBERTSON (San Francisco): The remarks made are very satisfactory to me. We have just about completed in San Francisco a high-pressure gravity system. It is supplied by a reservoir 735 feet above the base, containing 2,500,000 gallons of water. In addition there are two subsidiary reservoirs of 250,000 gallons and 750,000 gallons at 150 pounds pressure per square inch at the base. It is the intention to divide the city into zones of pressure.

San Francisco is a hilly city and the business block is on a low level; 150 pounds pressure is expected ordinarily, with an emergency supply through large mains by high pressure. The additional supply, in case of damage by earthquake or otherwise, can be obtained from two fire tugs with a capacity of 10,000 gallons of water per minute.

We hesitated as to whether we should connect with the sprinkler systems, and we concluded it would not only be a safe thing to do but very desirable. The only objection would be the possible danger to the sprinkler system by high pressure on the main in case of fire, where everything would be opened up. One thing in this connection is that the largest pipe connecting with the main should not be more than 4 inches. In fact, a pipe 2 inches in diameter would give enough pressure. I was a little afraid of the difficulties to be encountered in making connection with the system mains, that people would dislike it; but the proposition has merit. With the proposition of shutting off supply at the corners we could shut off the water and prevent undue waste any time.

In the last six months two or three breaks have occurred in the street due to lack of support on account of excavations; yet the main was shut off expeditiously and only a relatively small quantity of water wasted.

MR. MORRIS: The high-pressure system as it to-day obtains in the cities means a pressure of from 200 to 250 pounds, and the working pressure should not be over 150 pounds. My thought about the matter is simply this: that the great bulk of buildings which above all need protection by sprinklers are those of moderate height. Those with wooden floors are of moderate height. In concrete-floor buildings very little danger is encountered as compared with the other type. It is not a hard proposition to maintain 150 pounds pressure at all times, and if 250 pounds pressure is needed on the few buildings that are very high, and mostly of concrete construction as I understand it, the modern fire engine is built to maintain a pressure of 250 or 275 pounds pressure.

MR. C. A. HEXAMER (Philadelphia): There seems to be one point overlooked, and that is the connection of the high-pressure service with the automatic extinguishing system. The service of the high-pressure main is on notice to the chief at the fire station to put on the pressure. In this city the lower pressure does not exceed 30 pounds. The high pressure was originally planned to be brought by a 12-inch main coming from George's Hill reservoir at 180 pounds pressure. We hoped it could be used without starting the pumps on ordinary fires; but as it stands today the high-pressure service connected to the sprinkler system in Philadelphia would not be an automatic high-pressure water supply connection. I would hold that an outside street connection to the sprinkler or standpipe system in the building to which a city fire engine or high-pressure connection could be made would be all that is necessary. My objection to this proposition is the possibility of the fire getting away from the sprinklers, destroying the large reserve, and thereby stopping the supply. The high-pressure service in the Philadelphia business district is supplied by four hydrants, each with 3-inch or 2-inch connection capable of being "siamesed." That is the extreme limit of the pump supplying 10,000 gallons per minute.

Mr. Cole (Boston): From the standpoint of the insurance engineer, the connection of the high-pressure system to the automatic sprinkler systems is good; but from the standpoint of the water engineer or fire department I think it is a dangerous experiment. The water may be getting away from the fire chief and he know nothing about it. In Boston we often go so far as to separate the low-pressure and the high-pressure systems. We have what is known as the high-and-low service systems, the latter of which supplies the sprinklers and certain of the buildings in the business district, the congested business district, and also furnishes water for domestic supply; but the fire chief must know at all times what his capacity is.

Mr. Robertson: I feel very much in earnest and do not think Mr. Cole's objection is tenable. In our city it is entirely impossible to depend always on the high-pressure system tank or reservoir. A man remains there on watch at all times taking account of the leakage, and this leakage is replaced every 24 hours—125,000 gallons a day. If you want to do a thing there is always a way to do it.

Mr. Hexamer: There is one thing I think Mr. Robertson overlooked. In San Francisco he has a gravity feed, also pumps when they are needed.

Mr. Cole: It is a question of quantity. The fire chief is not using the water that goes out through the sprinklers, and does not know where it is going; but if going out through the sprinkler system he may have counted on a 10,000-gallon pressure and used 5000, and when he calls for the other five he cannot get it.

Mr. Evans: If there is no further discussion it is now in order to consider the resolution under this topic.

Mr. Hexamer moves the adoption of the resolution; seconded by Professor Woolson. Motion carried. Meeting adjourned.

Resolution Adopted on Topic 6

"It is the sense of this Convention that—

(a) All communities need physically a sure water supply, broadly usable by citizens for private fire protection, under the least

broadly usable by citizens for private fire protection, under the least

onerous terms—also adequate modern fire-fighting apparatus with proper personnel to operate same; also an adequate alarm system—all proportionate to the character, area and population of each community; and

(b) All fire-fighting forces should be efficiently organized in enduring form, under legal control and discipline when possible; their morale and requirements should be high and solely influenced by good of the service considerations; and the training should be constant and adequate for efficient fire-fighting and fire prevention inspection and the purchase and maintenance of valuable special mechanical apparatus."

WEDNESDAY MORNING SESSION

October 15, 1913

Topic 7—"Equipment"

NOTE.—It is necessary to heat, light, ventilate and otherwise "equip" every unit building wherever located; and this equipment is all productive, and/or receptive, of fire hazard—hence its appropriate consideration at this point.

The meeting was called to order at 9.20 by the Chairman.

MR. EVANS: The first paper on this topic will be by Mr. Lawler. The tentative resolution is as announced. The words "productive" and "receptive" refer to whether equipment so described would readily introduce fire hazard into the building, or be especially liable to catch on fire.

"EQUIPMENT"

By Mr. G. S. Lawler, Electrical Engineer of the Inspection Department of the Associated Mutual Fire Insurance Companies of Boston

All buildings except those of very minor importance are provided with auxiliary equipments of greater or less extent which are necessary for comfort, convenience, health, supplying power to manufacturing processes, etc. These auxiliary equipments are common to a large degree with all buildings and are only partially dependent on the regular occupancy; although of course they are, or should be, of a type and so laid out as to best suit the particular conditions. Most of these equipments have some fire hazard connected with them which, however, may be eliminated to a great extent if proper care and precautions are taken. The more important of these equipments will now be called to your attention and discussed in a very general way:

HEATING

Hot Air—This system is used largely in residences where natural draft is employed, and in some manufacturing plants where blowers are installed. The heater should be carefully installed and operated to prevent the flue or the hot air pipes becoming overheated and setting fire to combustible material in the near vicinity. The fire box and ash boxes are also a source of danger, and care should be taken to keep combustibles well clear of them. The pipes, unless run in such a manner as to avoid it, may also serve as a means for fire quickly extending from the room of its origin to the floors above and to adjoining rooms.

Steam—The boiler has practically the same hazard as the hot-air heater and in addition has an explosion hazard where high pressures are carried. The boiler should be placed in a separate building wherever possible in the more important properties. The heating pipes and coils should be kept clear of combustible material. Where reducing valves are used they may get out of order and permit high pressures and corresponding high temperatures in the coils. The preferable place for heating coils is high on the walls or under ceilings.

Hot Water—This system has but little or no fire hazard outside of the heater and flue.

Gas—This is used only to a slight extent and then mostly in small rooms during chilly spells between hot and cold weather. It is used, however, to quite an extent for cooking purposes. Where the heaters are of the stationary type they constitute but little fire hazard, but this is not true in the case of portable heaters using flexible tubing for connections. The tubing may be pulled off and the gas ignited; also, the heater may be placed too near combustible material.

Electricity—This kind of heating is used under about the same conditions as gas heating. The hazard lies in the wiring and the fact that portable heaters may be placed too near combustible material.

LIGHTING

Kerosene—This type of lamp is almost out of use except in the older buildings and country residences. Its fire hazard lies in the ease with which the lamps may be overturned and the oil ignited, and the fact that the lamps being portable may be placed too close to combustible material. There is also an explosion hazard in case the lamps are allowed to become dirty and the oil low.

Gas—These lamps are hazardous owing to the open or partially open flames into which combustible objects may be carelessly moved and into which curtains, etc., may be blown by wind. Swinging wall fixtures may be left with the flame against the wall.

Electricity—This is the modern system of lighting and is now used generally in manufacturing plants, mercantile and office buildings, the better class of city residences, etc. Unless carefully installed this system may be a real fire hazard, but where properly put in it is the safest system of lighting known. Its many advantages will cause it to gradually replace the other systems.

The possible seats of hazard are too numerous to mention. The chief sources, however, are breaking down of insulation either of wire or fittings, resulting in arcs being established; overloading which may cause a dangerous rise of temperature resulting in direct ignition of combustible material, or a rapid deterioration of material used in the construction of the electrical system; sparking at moving contacts; failure of fuses due to poor workmanship, etc.

Electric wiring and construction of devices have become well standardized at present so that most of the old causes of fire have been remedied. The National Electrical Code, consisting of rules for installation and construction of electrical systems and fittings, where conscientiously and intelligently followed, tends greatly to reduce the fire hazard incident to the use of electricity. In addition, electrical fittings are now examined and tested in accordance with the code specifications at laboratories established for the purpose. These laboratories publish a list of the fittings found satisfactory for the benefit of users. Most inspection departments use the "code" and "approved fittings" list as their "standard," as do most of the municipal inspection departments. Undoubtedly the installation of electrical equipment is better supervised to-day than any other kind of building equipment from the fire standpoint.

PLUMBING

This equipment is a hazard during installation and in making repairs due to the presence of the plumber's gasoline heater and torch. Frequently the openings around pipes through floors and walls are poorly closed up, thus leaving openings for the rapid spreading of fire.

VENTILATION

In designing such a system care should be used that ducts and openings do not form passages for fire from floor to floor or room to room. This is specially important where blowers are used which force air at high velocities through the pipes. Such systems should have the air supply taken from points where fire is not liable to occur and be drawn into the intakes. Several instances have occurred where an accumulation of oil and dirt within the pipes has become ignited and the fire blown for considerable distances through them.

POWER

The hazard of shafting and pulleys lies in the rubbing of belts, spontaneous combustion of oil drippings if neglected, and overheating of bearings due to lack of oil or wear.

The electric motor hazard is similar to that of the electric lighting system (which has already been covered), with the addition that the insulation on the revolving parts is more difficult to maintain in good condition and free from oil and dirt. Motors of the direct current type are more of a hazard than those of the alternating current type, due to the commutators where sparking is apt to occur. Some types of alternating current motors are very hardy and free from fire hazard. The remarks regarding the National Electric Code apply to installation of this type also.

TRANSFORMERS

These are quite generally used with alternating current equipments of large power. A transformer is probably as free from trouble as any piece of electrical apparatus, but when trouble does occur in a transformer of the oil-cooled type it is liable to be serious. The oil when ignited is difficult to extinguish with water; in fact, the water may scatter the oil and thus aid in spreading the fire. To avoid hazarding important buildings, transformers should be located on the outside of brick walls or on poles or in separate detached non-combustible buildings; or, where they must be placed inside important buildings, they should be put in drained, non-combustible vaults provided with high door sills and standard fire doors.

SIGNALING SYSTEMS

This would include bell, fire alarm, telephone system, etc. These have very little hazard in themselves as the voltages and currents used are generally low. Their chief hazard lies in the liability of their becoming crossed with light and power systems, resulting in relatively high voltages being diverted to systems not designed for them. In addition, lightning may enter buildings over wires where the wires are run for considerable distances outside.

TEMPORARY DECORATIONS

Owing to these decorations being used for only a few days, the material is generally of a very light, flimsy character, and but little care is used in putting it up. Carelessness in putting up may leave the decorations near where they may be easily ignited, while after ignition fire will rapidly spread over them.

MATCHES

Matches are now used mostly in residences, and for smoking purposes. Where smoking is done, proper receptacles for holding the burned matches should be provided. In industrial plants smoking should be prohibited. Smoking is often done surreptitiously in toilets; and where this is liable to occur the toilet rooms should be entirely non-combustible. Many fires have been caused by the old-style sulphur matches and so-called "parlor" matches being stepped on, or by rats carrying them away and gnawing them. Only so-called "safety" matches (which require the heads to be rubbed on a special preparation) should be used, and even then care should be used to prevent their being scattered around.

GASOLINE AND FUEL OIL

Gasoline is dangerous owing to its inflammability and the heaviness of its vapors. It should be kept outside of buildings except when being used, at which time the quantity brought in should be small and contained in approved cans having self-closing outlets. Where a considerable quantity is stored it should be kept in a suitable underground tank, and the supply should be drawn as needed by hand pumps into special small cans. The pumps should be located on the outside in a manner convenient for the conditions.

Fuel oil should also be stored outside in tanks buried underground. The burners should be on the ground floor, and all piping except that rising to the burners should be underground to protect them from possibility of being struck and broken. The pipes rising to the burners should also be protected in some suitable manner.

There is a multiplicity of different types of auxiliary equipments for buildings, and these generally are being designed and installed in a satisfactory manner from the fire standpoint. Almost all of them have possible points of weakness. The best methods for strengthening these weak features should be standardized where not already done, and this should be made so clear that those concerned will put in the safest equipments to be had.

Some of the auxiliary equipments are now regulated by municipal ordinances and State laws, and this practice is extending rapidly. In some States fire marshals are now empowered by law to make and enforce regulations tending to control the fire hazard. These ordinances, laws and regulations, are not uniform. Every effort should be made toward their standardization and extension to localities not now covered.

Where the work to be done is extensive, competent architects or engineers are usually employed, but this is not always true. For the smaller installations such men are even less used. This is unfortunate, for these equipments may be installed so as to introduce serious hazards as above mentioned. With expert advice such danger could have been avoided. The employment of the services of experts, even for work of minor character, is therefore strongly urged, for these men of large experience and with a knowledge of the best practice will see that the equipments are laid out in a systematic way, with due regard not only for the efficiency of the equipment as viewed from the standpoint of what it is intended to accomplish, but also for its safety from a fire point of view. Too often these equipments have been installed in a haphazard way, resulting in poor efficiency, interference of one system with another, dissatisfaction on the part of the owners or tenants, and a direct fire hazard—all of which could have been avoided with less ultimate cost in most cases if experts had laid out and supervised the work.

MR. EVANS: Mr. Edward R. Hardy, Assistant Manager of the New York Fire Insurance Exchange, of New York City, who was to have joined in the above paper, found he could not do more than review it, because of indisposition, and Mr. Lawler could not find time to send it to him because he only arrived here with the completed draft last night. So we have only this one paper on equipment, but we are satisfied it is of the best that could be had in the country. Mr. Lawler replaced Mr. R. H. Morris, whose absence from home forced him to decline the assignment. Any comments?

MR. ROBERTSON (San Francisco): I would like to ask if there are any statistics, or knowledge obtainable, with regard to the danger from a water heater in a room where it is burning all the time and floor gases induced—a danger of gas becoming extinguished from a draft of air, and the duct being left open and allowing an accumulation of gas in the basement. There are several of the type I refer to, and one explosion occurred in our city which was attributed to that. Is that customary or does it occur often?

MR. ALTON D. EDES (Plymouth, Mass.): I know of two occasions where there were similar explosions from heaters. One heater was called the "Bonner." One explosion was severe, shaking the house and filling the cellar with smoke.

MR. COLE (Boston): I should like to ask whether or not electric signs on buildings would come under the subject of "equipment"?

MR. EVANS: I think it is decidedly equipment. It is not construction. Let us take it up.

MR. COLE: It is, from a fire standpoint, an extremely dangerous proposition, not only because of electric current but because the firemen cannot get on the roof or through the roof back of the fire. I think electric signs should be strictly regulated as to the material used and where placed on the roof. We requested the Board of Underwriters in Boston to take up this matter. The fire department made a set of rules (of course the fire department is against a sign on a building anywhere) but they were without authority to enforce them. I wonder if there is any authority in any other city?

MR. EVANS: Would your police department in Boston have the summary power to control a danger of that kind?

MR. COLE: They have not under present legislation.

MR. EVANS: It is not under police power?

MR. COLE: It would be with regard to signs that run over into the street, but no one seemed to know of any authority for signs on buildings except the Commissioner of Public Safety. There seems to be none on the danger of fighting fire.

MR. W. E. BURRAGE (Boston): I am glad that matter was brought up. As to having signs overhanging the street, that is without doubt a detriment in the way of fighting fire and objectionable from other points of view.

MR. EVANS: My impression is that very lately, through a commission, some investigation is in process in New York City with respect to the control of signs. I mention this with reservation with respect to my recollection. I believe the proposal in view is something along the lines of French control, in which they tax objectionable signs out of existence. That is a feasible plan. Every sign of every character in France pays a substantial tax; and the tax, I believe, is a local imposition on all signs. If dangerous or unsightly, or a nuisance in any respect, as in New York (robbing people of sleep—the bright ones), they are controllable to actual elimination by tax. As to police control, I do not know of any.

MR. HOLT: Where the State is under common law, I think you will find there is ample power as a general provision with respect to life and property. Where the State is under statute law the absence of the statute might perhaps throw it out.

MR. HEISTER (Pittsburgh): In Pittsburgh these needs are regulated by ordinances, which specify the construction and electrical equipment, the former being under charge of the building inspection department and the latter under the bureau of electricity.

MR. PORTER (New York): The effort in New York City has been on the part of the Fifth Avenue Association, which worked along the line you suggest to prevent unsightly signs in their district. But there is opposition along the line of the Broadway district. The Fifth Avenue Association has not gotten anywhere with regard to their proposal.

MR. EVANS: If there are no other comments or remarks on this subject, we will now take up the text of the appropriate resolution.

MR. HOLT: I want to ask whether the word "productive," which you found desirable to explain, would be better substituted by something like "positive"? That word is used so repeatedly with regard to fire hazard.

MR. EVANS: I think it has a different meaning from the intent used here. There are very many hazards with respect to fire. One point in the matter of "Protection" was to gain negative protection by controlling gas lines. All equipments have those same elements of hazard in them. For instance, a hotel not far from here, for years—once a week on the average—had a bad fire in the chimney which took off the gases from ranges in the kitchen. In this chimney—a large stack going up to the top of a high building—there was a ventilating system which was necessarily quite inaccessible. Now a ventilating fan runs at a high speed which, in itself, makes it difficult to keep it oiled. In this case it was something of a feat to get oil into the fan bearings. The fan constantly ran at high speed in high heat, and hence was just in condition to dissipate the oil in its bearings and to inherit any fire that came along. Through that flue heated gases were rising constantly from the ranges, and as they rose they deposited carbon, so that the sides of the flue were always lined with the essence of fat. Periodically a haphazard spark ignited this carbon and the flue became a beautiful kind of Bunsen burner, with a white flame running up high into the air above the eight-story building. That was a "productive" hazard in the ventilating fan and a "receptive" hazard in the operation of the range equipment. I don't think the language is perfect, but I do not know of any particular language fully descriptive on this point. Is it your pleasure that the resolution be adopted?

Mr. Holt moves the adoption of the resolution. Mr. Mallory seconds the motion. Carried unanimously.

Resolution Adopted on Topic 7

"It is the sense of this Convention that:

All equipment for buildings should be adequately designed and constructed with respect to its fire hazard—productive or receptive—and that its use should be predicated on reasonable compliance with such requirements, and should be reasonably regulated everywhere by law."

Topic 8—"Compulsory Physical Standards"

NOTE.—If the thought is sound that reasonable, *enforced,* laws are necessary to control the purely physical problems of so constructing, protecting and equipping buildings as to abate fire waste, then it becomes of maximum importance to define *uniformly* and *precisely* the not unduly burdensome technical physical things required in such laws by the best experience—hence this consideration at this point.

MR. EVANS: The next topic is No. 8—"Compulsory Physical Standards," under the tentative resolution announced. Continuing the same informal course of action I have pursued throughout the meeting so far, I will read the first paper on this topic. It was prepared largely by me; and in its general lines has the approval of Mr. H. A. Fiske, of New York City, who is named in connection with it, and of Mr. H. M. Wilson, of Pittsburgh. It was found during production that it was simpler and better to embrace both of the announced phases of the topic in one paper. Mr. Wilson, the United States engineer in charge of the Experiment Station of the Bureau of Mines, was here this morning but was called by telegram to Washington and just a few minutes ago had to leave for a train, so that I will read his paper after my own.

Dr. S. W. Stratton, of the Bureau of Standards, Washington, is now in Paris attending an International Convention on Weights and Measures. Dr. E. B. Rosà, Acting Director of the Bureau of Standards, is here and will have some comments to make on the subject. I will say here that any correction of error as to facts whatever on my part will, if presented,,be read into this Record along with this paper.

"COMPULSORY PHYSICAL STANDARDS"—1

By Mr. Powell Evans

The term "compulsory" defines the proposal to make all standards described below so reasonable as to be capable of incorporation in State laws and city ordinances for widespread compulsory use without imposing undue expense on the public. These standards are all "physical," hence the use of that descriptive term.

The term "STANDARD" as here used is intended to mean:

1. "STANDARDS" of "APPLIANCES" (FACTORY UNITS), viz:

(a) Those tested in the Underwriters' Laboratories, Inc., Chicago (owned and operated by the National Board of Fire Underwriters), which, if approved, are listed by them and published by the National Board of Fire Underwriters, and as a rule adopted by virtually all of the stock insurance local boards.

Three of these "approved" lists have been issued, viz:

Electrical Fittings

Asbestos
Attachment Plugs, Fuseless
Attachment Plugs, Fused
Auto-Starters
Bushings, Porcelain
Cabinets
Cables, Armored
Canopy Insulators
Circuit Breakers, Air-break Type
Cleats, Porcelain
Conduit, Rigid
Conduit, Flexible (Steel)
Conduit Miscellaneous
Conduit Boxes, For General Use
Conduit Boxes, For Use Only Where Entirely Exposed
Conduit Boxes, Covers
Conduit Boxes, Supports For
Conduit Boxes, Floor Outlet
Conduit Outlet Bushings and Couplings
Conduit Outlet Plates
Current Taps, Multiple Type
Current Taps, Series Type
Cut-Out Bases, For Cartridge Type Enclosed Fuse
Cut-Out Bases, For Edison Plug Fuses
Cut-Out Bases, For Open Link Fuses
Cut-Out Bases, For Sealable Service and Meter Fuses
Decorative Lighting Systems, Temporary Work Only
Decorative Lighting Systems, Miniature Outfits
Fixtures, Standard (Electric and Combination)
Fixtures, Theater Stage, Show Window and Show Case Reflectors
Flexible Cords (See Wires)
Fuses, Enclosed, Cartridge Type Casings
Fuses, Sealable Service and Meter
Fuses, Small Special
Fuses, Plug Type
Fuses, Open Link
Ground Clamps
Hanger Boards, Arc Lamp
Heaters, Electric Flat Irons, Soldering, Curling
Heaters, Electric, Other Types of
Incubators and Brooders
Insulating Joints for Fixtures
Insulating Materials
Insulating Paints
Insulating Supports
Knobs, Porcelain
Lamps, Arc
Lamps, Incandescent
Lamps, Mercury Vapor
Lamp Adapters
Lamp Adjusters
Lamp Clusters
Lamp Guards
Lightning Arresters
Measuring Instruments
Miscellaneous, Approved for General Use
Miscellaneous, Special Appliances
Motor Operated Appliances
Moulding Fittings
Moulding, Metal
Panelboards
Picture Machines and Appliances
Protectors
Receptacles, Standard
Receptacles, Sub Bases
Receptacles, Weatherproof
Receptacles, Candelabra and Miniature
Receptacles, For Attachment Plugs
Receptacles, Stage
Rheostats
Rosettes, Fused
Rosettes, Fuseless
Sign Machines
Signs, Electric
Sockets, Standard
Sockets, Porcelain Shell
Sockets, Weatherproof
Sockets, Candelabra and Miniature, for Indoor Use Only
Switch Boxes, Metal
Switch Boxes, Metal, Covers for
Switches, Automatic
Switches, Combination Cutout, for Cartridge Fuses
Switches, Combination Cutout, for Plug Fuses
Switches, Fixture
Switches, Knife
Switches, Oil Break
Switches, Series Arc
Switches, Snap, Pendant
Switches, Snap, Door
Switches, Snap, Surface (600 Volts)
Switches, Snap, Surface (Not over 250 Volts)
Switches, Snap, Sub Bases
Switches, Snap, Flush Push Button
Switches, Snap, Flush Rotary
Theater Appliances
Transformers
Transformers, Bell Ringing
Tubing, Flexible
Wires, Rubber Covered
Wires, Fixture
Wires, Flexible Cord
Wires, Slow-Burning
Wires, Slow-Burning Weatherproof
Wires, Weatherproof
Wires, Flameproof (for Switchboards)
Wires, Miscellaneous
Wires, Varnished Cambric Cable

Fire Pumps (steam)
Fire Pumps (electric)
Fire Pumps (centrifugal)
Fire Pumps (rotary)
Gas and Gasolene Engines
Gasolene Vapor Gas Lighting Machines, Lamps and Systems
Gasolene Vapor Stoves, for cooking and heating
Grain Dryers
Gravity Tanks
Hose Couplings and Hydrant Fittings, for public fire service
Hose Houses, for mill yards
Incubators and Brooders
Kerosene Oil Pressure Systems
Lightning, Protection Against
Municipal Fire Alarm Systems
Nitro-Cellulose Films (storage and handling)
Oil Storage (fuel), storage and use of fuel oil and construction and installation of oil burning equipment
Oil Storage (fuel), storage and use of fuel oil and construction and installation of at ordinary temperatures give off inflammable vapors
Oxy-Acetylene Heating and Welding Apparatus
Railway Car Houses (storage and operating), Construction and Protection of
Signaling Systems, used for the transmission of signals affecting the fire hazard
Skylights
Sprinkler Equipments, automatic and open systems
Steam Pump Governors and Auxiliary Pumps
Uniform Requirements (standard mill construction, "inferior" construction, general hazards, oil rooms, general protection, stairway and elevator closures, watchmen, thermostats, etc.)
Valves, Indicator Posts and Hydrants, for mill yard use
Waste Cans, Ash Cans, Refuse Barrels, Fire Pails and Safety Cans for Benzine and Gasolene
Wireglass and Metal Window Frame Construction
Underwriters' Laboratories, general information in reference to the nature of its work and the terms and conditions under which tests of fire appliances and materials are conducted

NOTE.—Others are pending in committees.

I will now explain in some detail the process of developing these "STANDARDS;" and give a point of view as to why as now put out for "VOLUNTARY" adoption some of them, at least, are unnecessarily high for *"COMPULSORY"* use by force of legal imposition when incorporated in State laws and city ordinances.

Suppose a manufacturer of electrical appliances wants to market a new switch to control electric light current. He finds no profitable market for such a device unless it is "approved" by the insurance underwriters having jurisdiction all over the country, because the underwriters in the aggregate have an understanding with the electric light plants in the aggregate that they will not turn current into property where the devices for its use are not made and installed in accordance with these "STANDARDS," and further because many cities have adopted and are now enforcing these privately and unofficially determined standards without first reviewing them. When the manufacturer begins to investigate what he should do to get this insurance approval he is directed to submit his device to the Underwriters Laboratories, Inc., in Chicago, on behalf of the stock companies, and to the Mutual Laboratory, in Boston, for the Mutuals. Very properly, neither of the controlling agencies in the matter volunteer to such a manufacturer assistance in detail to develop appliances in design and practice in the original instance. Any other course would be in effect a divulgence of trade secrets imparted in confidence.

In the Underwriters' Laboratories they submit such appliances to analysis and test based on their experience and judgment, with conference accorded groups of manufacturers interested if organized to express the sense of their art—but not otherwise. Finally they formulate their conclusions on the device—changed and modified as may be required and agreed through the various tests and conferences. If the engineers and managers of the laboratory decide on a satisfactory report they then submit it, with a sample of the device if not too bulky, to their counsel —now made up of 22 men, who, with two exceptions (marked with stars below) are all primarily occupied in the fire insurance field:

Messrs. T. B. Sellers, Manager, Ohio Inspection Bureau, Columbus, Ohio;
R. G. Potter, Secretary, Underwriters' Association of the State of New York, Syracuse, N. Y.;
*Dr. S. W. Stratton, Director, Bureau of Standards, Washington, D. C.;
H. H. Glidden, Board of Underwriters of Chicago;
E. B. Hatch, The Union, Chicago, Ill.;
W. H. Merrill, Jr., Manager, Underwriters' Laboratories, Inc., Chicago, Ill.;
W. C. Robinson, Chief Engineer, Underwriters' Laboratories, Inc., Chicago, Ill.;
A. W. Hadrill, Secretary, Canadian Fire Underwriters' Association, Montreal, Canada;
W. O. Robb, of Pate & Robb, Insurance Brokers, New York City;
F. J. T. Stewart, Supt. of Surveys, New York Board of Fire Underwriters, New York City;
W. E. Mallalieu, General Manager, National Board of Fire Underwriters, New York City;
Wm. A. Stoney, Manager, Underwriters' Bureau of the Middle and Southern States, New York City;
Louis Wiederhold, Jr., Secretary, Underwriters' Association of the Middle Department, Philadelphia;
Charles A. Hexamer, Secretary, Philadelphia Fire Underwriters' Association, Philadelphia;
*Col. B. W. Dunn, Chief Inspector, Bureau for Safe Transportation of Explosives, New York City;
H. C. Henley, St. Louis Fire Prevention Bureau, St. Louis, Missouri;
E. F. Mohrhardt, Secretary Board of Fire Underwriters of the Pacific, San Francisco, Cal;
H. L. Phillips, Manager, Factory Insurance Association, Hartford, Conn.;
C. M. Goddard, Secretary, New England Insurance Exchange, Boston, Mass.
F. E. Cabot, Secretary, Boston Board of Fire Underwriters, Boston, Mass.
Gorham Dana, Manager, The Underwriters' Bureau of New England, Boston, Mass.
E. A. Northey, Manager, New England Bureau of United Inspection, Boston, Mass.

If any member of the above council votes negatively the laboratory, under its rules of operation, is required to bulletin this objection to every other member for a revote. This operation may result in further tests and changes in the apparatus, particularly as it is the custom of the laboratory management to try to secure a unanimous vote. Finally, however, when all changes and tests possible have been made and the physical conclusion is reached by the engineering management of the laboratories, a show-down vote is taken by this council and the majority rules.

Formerly the above function rested in a National Fire Protection Association Device Committee, but of late years it has been lodged in the above Laboratory Council, made up largely from committees of three separate organizations which were merged with the National Fire Protection Association when the latter decided to discontinue endorsing or criticising proprietary articles.

The Mutual Laboratory in Boston similarly receives an appliance and goes through the same general motions through their engineers; and reports—on the automatic sprinkler, for instance—to their Sprinkler Committee, composed of three heads of their largest companies, all experienced engineers, who in turn pass on their report to their full conference, on which sits a representative of each of the nineteen odd companies, and a vote is taken in which the older and more experienced representatives have the predominating influence; and this vote determines the fate of that device before that jurisdiction.

Unless the manufacturer can get both of these stock and mutual approvals he cannot in practice make much of a success of his business; and very often he must act as an intermediary between these powerful and independent jurisdictions and draw them into accord before he can get the same thing adopted by both.

This control does not stop at the test of the physical unit. It is now extended, in the case of the Underwriters' Laboratories, to requiring an applicant to materially expose his business, financial and commercial, to them; and conduct it in sensible part in accord with their policy—as regards the production of approved devices.

The Underwriters' Laboratories also widely control the continuous factory production of all "approved" devices and products by the application of a "label" service applied to all units of production to which this service is applied under agreement, which is intended to be a public notification that everything so labeled has been inspected and found up to the standard of its original approved prototype. Any disagreement arising with manufacturers in the conduct of this "label" service is committed to arbitration. This label service is now in extended and widening use; and, with the fees charged for tests, provides the bulk of a large income for operating the Chicago plant to accomplish a quasi-public regulation.

The report of the Committee on Lighting, Heating and Patents of the National Board of Fire Underwriters, dated New York, May 22, 1913 (obtainable from the National Board of Fire Underwriters on request), gives many details in this connection.

Finally, the laboratories reserve the right to take specimens of any approved appliance out of service conditions anywhere in the country and test same after years of use, and if found faulty in their judgment their ninety-odd associated local boards or associations all over the country (stock) and the various constituent companies (mutual) may condemn such as they assume fall in the class of the samples tested, and influence their change or renewal by the makers at very low cost by virtue of their good will. Such action has been taken repeatedly about automatic sprinkler devices of very respectable age, thus forcing on the maker—not the user—a virtual long-term guaranty of maintenance without his assent, which must be included in the original cost, and is a proportionate element in the price of the apparatus.

The Underwriters' Laboratories, Inc., were inaugurated and promoted by insurance influences, and have been very substantially supported by them; further, the fire insurance companies were the first to recognize the importance of fire protection, and of standardizing materials, apparatus and equipment for which fire insurance credits were to be asked and allowed; and hence feel that they originally had, and still should have, immediate and vital interest in this work. They express at this time willingness to open all the facts about their work and organization and every detail of their business to any interested manufacturer or other individual, and to permit any client to make an audit of all their charges from their books for work concerning them respectively.

Hence, both the stock and mutual laboratories' managements hold that their enterprises and approvals are private business in the main—although in one way and another a large proportion of the public is forced to buy insurance (which by virtue of economic necessity imposes the above "standards") on a large part of all created property,—for instance, as a partial basis of commercial credit, and as a condition imposed in affecting loans secured by mortgages, particularly from trust estates, etc. Under this idea both laboratories feel free to receive, test and approve appliances in accord solely with their views of management. When the above very important and far-reaching control actually exercised is considered, the question of some public balance-wheel agency in the matter becomes of grave and general import.

The above outlines briefly the course of any *unit* device for sale in America seeking the status of "approved" by the insurance laboratories.

The "Standards of Practice" (listed above), developed and recommended by the National Fire Protection Association and published by the National Board of Fire Underwriters and used by virtually all underwriters, are formulated through volunteer committees, including many non-insurance members.

These take up the study of the subject given in charge, collect the best experience obtainable from all sources, exchange views, and formulate their tentative conclusions, which are then printed in bulletin form for report and consideration by the annual meeting, or the executive committee when clothed with power. These reports—especially years ago when in effect there were no standards—were often hashed and rehashed for several years before sufficient accord in views and practice were achieved to make their practical working application possible.

Too much credit cannot be given the pioneers in this work for the time, earnestness and capacity with which they assumed and pursued these self-imposed duties whereby the present order has grown out of the chaos in such matters then existing. Sometimes, however, hardships have crept into such practice rules, in the effort to regulate so closely as to avoid duplication of an underwriting loss chargeable to a given set of conditions, in measurable disregard of the unduly high cost of such regulation.

For instance, in the winter of 1911-12 a cold storage room for storing furs in a large department store in New York caught fire and occasioned a heavy insurance loss. At the 1912 annual N. F. P. A. meeting the chairman of the Committee on Cold Storage rooms reported on behalf of his committee a recommendation to limit the size of such rooms to 2500 cubic feet—an admitted prohibitively costly rule of construction and operation. The above origin of the recommendation was admitted and his conclusion was modified. In this case no harm was done, but the incident throws light on the genesis of many rather taut requirements now existing in many of these standards.

The experience of a generation has shown that 90 per cent. of all fires are extinguished by sprinkler systems in the relative incipiency of the fire with ten or less sprinkler heads open. Obviously, therefore, a "compulsory" automatic sprinkler standard of installation with connections, pumps, tanks and reservoirs, which would properly care for ten or less heads at the same time, would extinguish 90 per cent of fires, based on a 25-year average. Obviously, therefore, buildings only protected to this extent by this admittedly most important fire protective apparatus would be infinitely better for life and property multiplied throughout cities under pressure of legal requirements than the very limited number of sprinkled buildings in congested areas as is now virtually the rule everywhere—in Boston, for instance, less than 5 per cent. of buildings in the city center being so protected. Such a standard would be much fairer to property owners in cities because requiring so much less investment on the average. In many cases surveys have shown that the heavy piping and accessories have almost doubled the cost of the system. There should be no need, under the experience above cited, for using bulk pipe in most buildings larger than 4-inch. If any sprinkler system is to meet the requirements of the underwriters and secure the *lowest rate of insurance,* then the underwriters by the *rate* power they wield can demand the present underwriters' ("voluntary") standard and it is up to the property owner either to put in this highest standard (taking lowest insurance rate) or not, as his interest determines; but the minimum or *"compulsory"* standard should be just as fair as possible in first cost to the property owner and as low as the average experience in sprinkler systems permits, especially for systems in cellars and high buildings for offices and other uses in congested city areas where very low insurance rates are not applicable to the average range of buildings and occupancies. Two sprinkler installation schedules are reasonably needed at this time.

Again, in congested city areas where the greatest danger exists, there has been a gradual development of high-pressure water service. The present underwriters' sprinkler system standard prohibits any smaller connection to water supply than 4-inch. Obviously a great number of 4-inch connections to a high-pressure system would introduce so much danger in event of breakage or leakage that such connections become inadvisable no matter how few sprinkler systems are in service.

Hence, under present rules high-pressure water supplies are not used for sprinkler systems. Smaller connections would safely and properly feed this 90 per cent. average of ten or less sprinkler heads. The "*compulsory*" or minimum sprinkler standard should, in my best judgment to-day, call throughout only for laboratory approved appliances and substantially N. F. P. A. standard head—spacing and valve requirements (or equals); but the pipe sizes should be brought down to provide for capacity to supply water for only 20 per cent. instead of 50 per cent. of sprinkler heads; and the pumps, tanks and water connections should follow the reduction in pipe size.

These standards on the whole have worked untold good, and without them American fire waste would undoubtedly have been far in excess of even its present high rate. Particularly notable value attaches to the work of the association in standardizing the hose couplings and hydrant fittings of the country to the end that all manufacturers of public department fire hose may furnish their purchasers with couplings having one uniform standard thread so that the same may be interchangeable between all cities, and any city thus be enabled to go to the relief of neighboring cities in the event of large fires or conflagrations.

Undoubtedly all of the current causes of fires throughout the country should be constantly critically examined and standards developed in each case whether of appliances or practice to eliminate or properly reduce these hazards.

The above "STANDARDS" are required whenever things they describe are used—by the large majority of all underwriters, stock and mutual, as a basis for favorable rates; and *non-standard appliances and practices* are either altogether rejected or penalized in the rate procurable on the same "standard" things. There is virtually complete insurance concert of purpose and action in this control, otherwise it would prove in effect abortive. These approval controls are based on adequate personnel and plant with the total practical field experience of all underwriting interests for years in hand for guidance. The above system has proven highly practical and effective; has been the only competent, critical agent in the matter outside of the manufacturers and contractors concerned to date, and has proven a powerful factor in improving all the arts it has touched and in advancing the cause of fire prevention and protection. Like every other human agency, however, it has developed some correctable abuses because of the intensely special expert and little understood nature of the business, and the fact that all laboratory authority is lodged in a limited and intimate circle of men owing primary allegiance to some insurance interest with few exceptions.

To date it has been a purely commercial despotism—benevolent in the main but despotism still—which is also measurably one-sided. This control lies at the heart of the insurance engineering system; is faithfully and continuously applied by the entire underwriting activity; and virtually covers and materially affects all created property of buildings and contents (life safety little considered so far in the matter) throughout the United States and Canada—without the owners of all this property really understanding the fact or having much to say about it, and without much government regulation of any kind to date—National, State or local.

This situation, developed and continued for years without any outside check, has quite naturally inclined those who have produced and operated and municipal governments are not the media for this control. It is a proper function only for the *National* Government; and its existing Bureau of Standards of the Department of Commerce affords the proper instrument at hand to act in this matter and thus safeguard the best common interests of the whole country—from a national, legal, and disinterested position of the highest technical authority.

The time is actually here when State laws and municipal ordinances are increasing in number all over the country and a marked further increase is imminent and inevitable—hence the extreme importance of getting these "STANDARDS" as near as may be uniform, correct and legally enforceable from the beginning. If the National Bureau of Standards would *examine* and if need be *modify* and then *accept* all such "STANDARDS" such course would only slightly change the present method of getting them into use; but it would produce fairer and better results, and more satisfactory to *all* parties to their use. Most States and cities would accept such "STANDARDS" issued with this added national authority without question—as the best, fairest and safest procurable; and generally incorporate them in their laws, with the result that these things physically would be defined in precisely the same uniform language all the time and everywhere—whereby gradually court decisions (which give force to so many laws) would be built upon a uniform descriptive base.

The Bureau of Standards, if it becomes active in this field, by its investigation of these fire hazard standards and announcement of its conclusions thereon would provide the physical descriptions in precise language of things to abate fire waste for voluntary adoption by all interested; and such action would be a great moral force to influence wide and speedy fire waste regulation.

It is in no case suggested that the Federal Government has any right to impose on any State or part thereof any of these standards; but merely that it can regulate the *production* of the standards themselves and thus add a higher and more impartial authority of legal origin to them, which would in turn tend to enlarge and expedite their use by all local governments and by the general public.

Nor would such Federal activity constitute either an actual or implied "approval" or "guarantee" by the National Government of any device tested and approved by any laboratory under any standard so evolved and published.

The Bureau of Standards would merely assure correct and uniform and fair-to-all *measures of performance,* and see that they were faithfully and equably applied in the common interest of all communities and citizens; and so much control, of such quality, is now greatly needed and can be lawfully and practically applied.

NOTE.—The above paper is a modification of that actually read at the Convention; based upon correspondence and a final interview in New York in the presence of a representative of the Bureau of Standards, with Mr. W. H. Merrill, Jr., manager of the Underwriters' Laboratories, Inc., all in accord with the sense expressed at the Convention.—ED.

MR. EVANS: I will now read Mr. Wilson's paper, which covers another phase of this subject.

"COMPULSORY PHYSICAL STANDARDS"—2

By Mr. H. M. Wilson, Member American Society Civil Engineers

The practice in testing, both as regards use and storage in buildings of such inflammables as oils, gasoline, alcohol, motion picture film, and explosives, and as regards structural strength and fire-resistant properties of materials of construction is one needing standardization. Such standardization has been attempted in some measure in the Underwriters' Laboratory of Chicago, and by the National Bureau of Standards, but is not practicable excepting with the advice and coöperation of such persons or institutions as have a thorough technical knowledge of the sources of production and supply and the methods of preparation for market. This applies particularly to petroleum products, the inflammable qualities of which differ materially according to the oil field they represent and to the method of distillation.

The same is true regarding tests of structural materials; for example, one brand of cement giving satisfactory results with a standard sand, gravel, or other aggregate, while the same cement may fail when used with a different aggregate or differently mixed. For these reasons, and because standards developed in any one municipality or State may not be the best applicable, it is desirable that they be formulated by the Federal Government so that they may be based upon a knowledge of all existing methods and material, may save duplication in various laboratories, and be universally applicable.

In like manner regarding standards of building construction for fire prevention. Here in particular are *minimum compulsory* standards desirable as distinguished from *voluntary* standards. The latter for floor slabs or for roof slabs as inserted in various building codes may through the influence of manufacturers or of politicians be so manipulated as to favor one product—in one case reinforced concrete, in another fireproof tile, in another structural steel—in such a manner as to impose expensive and not necessarily the best construction. So, too, for elevator shaft protection, protection of roof against flying embers, and protection of external openings. All these are necessary and desirable, yet their general adoption may be made practically prohibitive by the imposition of ideal voluntary standards, or by conditions of local production and markets.

For the above reasons, and likewise with a view to the prevention of unnecessary duplication in their preparation if left to the various municipalities and States, or to the prejudiced consideration of fire underwriters or manufacturers of materials, such standards should be developed by the Federal Government.

The imposition of structural standards, universally applicable throughout the United States, is one influenced so greatly by reason of cost of materials locally available, and by transportation and market rates, as to require the greatest care, the broadest knowledge of nation-wide physical condition, and the most general treatment. The reduction of fire waste by the imposition of minimum compulsory physical standards is so closely associated with questions of regulation, insurance underwriting, rates, and methods; and universal legislation concerning fire prevention organizations, such as State marshals, city fire-fighting departments, building codes, and kindred questions; as to require the coördination of all when the question of Federal assistance is raised. These are the larger problems and the ones for which States and municipalities have made provision; yet the variation in practice as between States and cities is so great that the Federal Government could well undertake to devote one bureau of its many to the nation-wide consideration of these problems. They involve so many questions which are similar for all conditions that general principles could well be formulated which would bring order out of chaos, result in coöperation and uniformity, and would greatly simplify business transactions.

There is no existing bureau of the Federal Government on which so great an undertaking should be imposed as that of attempting to fix physical standards for fire prevention appliances any more than for fixing standards for construction, for regulation or for legislation. Every existing bureau is charged with some specific duty to which its first attention must be directed, and the addition of this new subject would have the effect of pigeonholing it by robbing it of that vigorous consideration which it would receive from a Federal bureau devoted to its interests. If, therefore, this Convention deems it wise to ask Federal aid in this matter, it is suggested that it petition Congress to provide a bureau whose energies shall be solely devoted to fire prevention in all its phases.

MR. EVANS: We will now hear a statement on this topic from Dr. E. B. Rosà, Acting Director of the Bureau of Standards of the Department of Commerce, Washington.

DR. ROSÀ: It is of course desirable that municipal ordinances and State laws regarding fire prevention should be wisely drawn and as uniform in character as practicable. If, therefore, compulsory physical standards were to be adopted by States and cities it is obvious that it would be of material assistance to such States and cities and would promote uniformity if some properly qualified agent were to formulate suitable provisions regarding such standards. If such proposed requirements were prepared by so experienced a body as the National Fire Protection Association, for example, it may be contended that it would be unnecessary to have them reviewed or approved by any agency other than the representatives of the States and cities which proposed to adopt them. In view of the fact, however, that it is of prime importance that such requirements be drawn with the greatest care and with the fullest knowledge, such a review by an independent agency would seem to be desirable. It is no reflection on the National Fire Protection Association to say that a review and approval by some independent agency would add strength to such proposals; and I know of no agency that would be at the same time both independent and adequate except the Federal Government. Whether the Bureau of Standards is the most suitable branch of the Federal Government for the purpose is a question which can only be answered after considering what the bureau is and what would be required. It would be desirable that the agency undertaking the work should be well equipped to study the proposed requirements; should be able to subject to physical test when necessary the materials or devices or processes to be required; should have funds enough at its disposal to make exhaustive investigations when necessary; should receive and carefully consider objections or protests; and should be independent of the insurance interests on the one hand and of manufacturers on the other. It should also have so high a standing with regard to its ability and independence as to command the fullest confidence of the public.

It is no reflection on the wisdom or integrity of a lower court that its findings may be appealed to a higher court, and it should be counted no disparagement of the agency that initiates the proposals for compulsory physical standards that they should be reviewed and approved or amended by some higher tribunal, if a tribunal that is able and willing to undertake it can be found. I do not say that the Bureau of Standards is the best agency for the purpose, and I could not promise that the bureau would do the work if it were asked to do so. If, however, Congress were to authorize us to do the work, and provided the necessary money, the bureau would of course undertake it.

In order that you may judge for yourselves whether the work in question could be done advantageously and satisfactorily by the Bureau of Standards, I may be allowed to give briefly some facts concerning the institution and its work. The Bureau of Standards of the Department of Commerce was established twelve years ago by act of Congress. It is not, as some suppose, merely a place for preserving the material standards of weights and measures, but is, on the contrary, an institution for establishing and maintaining standards employed in measurements of lengths, volumes, masses, electrical quantities, magnetism, heat and temperature, light and other magnitudes; for testing a great variety of instruments employed in manufactures, trade and in scientific and engineering work, and for investigations of methods of measurement and the properties of materials. It has a group of well-equipped laboratories in the city of Washington and a considerable force of well-trained specialists, physicists, chemists, electrical and mechanical engineers and others to carry on the work of investigation and testing. It does its work for the Federal and State governments and for Federal and State institutions free of charge, but collects a fee for work done for private parties or municipalities. Work so done, however, is only such as cannot be done by private laboratories or other private agencies. The bureau is careful to come as little as possible into competition with consulting engineers or private laboratories. On the contrary, it aims to help such engineers and laboratories by publishing its methods and the results of its investigations for their use, and opens its laboratories to the fullest inspection of visitors.

The Bureau of Standards is the largest national standardizing institution in the world, and its equipment is in some respects unrivaled. It is not, however, as yet fully equipped and is looking forward to the erection of more buildings and the provision of additional equipment. A large increase in its personnel will also be necessary before it can handle all the work that it has been asked to undertake.

The bureau does a large amount of testing of instruments and materials, much of which is for the various departments of the Federal Government. It has tested all the cement and many of the supplies for the Panama Canal; building materials for the Supervising Architect's Office; sugar and textiles for the Customs service; paper, ink and printers' supplies for the Government Printing Office and the Post Office; and electrical instruments, electric lamps, electric fans and other electrical supplies for all departments of the Government. Standard chemical samples of many kinds of metal and alloys are furnished to individual chemists throughout the world; thermometers, pyrometers, calorimeters and other heat-measuring instruments to physicians, scientists, manufacturers and engineers; besides weights, standards of measure, engineers' tapes and chemical glassware, as well as a considerable variety of optical apparatus.

Various investigations are now under way on structural materials; on steel rails and car equipment from the standpoint of accident prevention; on bridge members to determine stresses and strains in the completed structure; on the properties of materials employed in refrigerating machinery, cold storage warehouses and as thermal insulators; on the fire-resistant properties of building materials; on the reduction of the life hazard in electrical practice; on the prevention of damage by electrolysis to water and gas pipes; and on some of the engineering questions involved in the regulation of public utilities by public service commissions; besides many other investigations of a scientific character.

In its assistance to and coöperation with municipalities and public service commissions the bureau often conducts tests or investigations of considerable magnitude. The information is offered freely, but no city or State official is obliged to accept it. Unlike the Interstate Commerce Commission, the bureau has no legal authority to enforce its decisions, and none is needed so long as its work is well done and its decisions are unbiased.

The Bureau of Standards is always glad to coöperate with States and municipalities on any question within its province, but is somewhat embarrassed in offering its services by the fact that as much work is coming to it spontaneously as it can handle at present. If, however, it should be deemed necessary, and it is believed that we are in a position to render an important public service, the bureau would make every effort to meet its responsibility in connection with the question proposed for discussion to-day, supposing, of course, that Congress provided the funds required for the purpose.

I may add in conclusion that the work in connection with public service commissions has increased to such an extent as to force us to ask for a considerable increase in our appropriation for this work. The work we have done has been welcomed by the public service commissions. They understand what is, of course, obvious, that it is much more economical for the Federal Government to establish certain standards, or rather to work out and recommend such standards, than if each State were to do it for itself. We have a test car for testing railroad scales, which is now in New England, and is going about testing scales of various railways. It might be well to demonstrate the fire waste proposition in some such way in the near future.

MR. EVANS: Is Mr. Kohn in the room? If not, will you, Dr. Rosà, take the chair *pro tem.?*

DR. ROSÀ: I prefer to be excused, please.

MR. EVANS: Then, gentlemen, the papers are before you for remarks.

MR. W. H. MERRILL, JR. (Chicago): I am deeply interested in this matter as manager of the Underwriters' Laboratories, Inc., and believe there are inaccuracies in the statements of fact that have been made here in this connection. I think it is Mr. Evans' desire to make all of these references and quotations and statements well within what is actually in practice to-day. If that course meets with the approval of the Convention, and the author of the first paper, I would be very glad to spend the necessary time before it is printed in the proceedings to assist in preparing a correct exposition of all our practices and people and lists to which in a measure incomplete and incorrect references have been made, in my judgment.

MR. GUERIN (New York): I want to thank the Chair for the paper. Like all other human documents I suppose it has its trifling errors of form and not of substance, to which the last speaker has just referred. What impressed me, however, was this: not that the names of certain people were confused, or practices were incorrectly stated (all of which I am sure will be corrected), but the fact that a need was there —the need to bring these standards under governmental control and not under private or semi-private control. The very issue presented by this paper to-day in its crystallized form is being taken up by men now gathering in New York, as I shall relate in a few moments. There is no question that insurance practices on the matter of physical standards are high, and so long as insurance is regarded as the private business of individuals the insurance interests have a perfect right to say how and under what conditions they would contract. But I am sure that the people have at last awakened to the fact that the fire insurance business is not a business of buying and selling—where a piece of property is purchased and title taken and conveyance made in a private trade—but they are convinced now that the insurance business so closely touches the public interest that the Government has the right and duty to enter upon it and regulate it.

This is not discrediting their methods; they are high and fine; but they do not meet the condition for the man who does not meet the highest standard outlined by them, and sometimes he does not get the insurance consideration he is entitled to. This has been taken up within a month by the State Insurance Department of New York; a case where a man who had a sub-standard equipment could get nothing for it. The insurance view was: "Not only is it sub-standard but we would regard it as an additional hazard."

Now, such conditions must be remedied; and I take it that is what the paper intended—that where a fair risk is reasonably provided for the man will get a reduction on his insurance policies. That is the thing we are coming to as sure as anything can possibly be. Let us discuss this question fully and freely, and let in the light of public opinion. The merchants and others to be insured throughout this country have a right to be heard, because it is common justice. I believe the insurance interests will meet us on this subject when they see how much the people are in earnest. The State Department of New York is calmly and surely pushing this along.

MR. EVANS: Before proceeding further on this subject I will venture to add the following remarks, which may prove helpful at this juncture. Mr. Merrill was not here at the opening session when I tried to make clear the spirit which is animating me in this whole work. During the last year, while I have been in close relation to the city of Philadelphia about its fire hazard situation (and this city has certainly needed help in the matter), we have been able to procure much valuable information for the good of the community; but, as a person who has taken a broad interest in this subject for the past five years and who has been measurably the leader in this work here for a year and a half, I have a private conviction that more light is needed by the public about fire waste and insurance, so that they will understand what the basic controlling facts are. I have tried to get accurate information, and I am willing to correct any statements or views advanced by me that are shown to be incomplete or in error.

MR. McDOWELL (Pittsburgh): As I understand it, the proposition is on the physical standards of insurance work. I think this resolution ought to be amended to request Congress to make sufficient appropriation for the Bureau of Standards, or some other appropriate department, to conduct investigations on the lines of materials and appliances for fire prevention. In the matter of one material offered as a fire protection, one day last March I was in Chicago at the Laboratories together with a manufacturer. I looked over their investigation, and I used all the arts of counsel in cross-examination, but I still could not discover their reasons for rejecting the material. I found it was a rule of the Laboratories not to give out the reason why material was not approved. I went expressly to Chicago to get this information, to know why this material was not approved, because the manufacturer had asked us to allow him to use it in building construction in Pittsburgh. I came back from Chicago without the information but with the direct statement that the causes of failure were not a part of the Laboratories' business.

Now that is a part of the business which we as constructors of codes are interested in. If we exclude a man's material he comes to us to ask why, and we tell him that "Professor John Smith of the Great Northern University" does not approve of it, and therefore we cannot. That is not a reasonable or logical basis for the rejection of material. I therefore move that this Convention ask Congress for an appropriation of say $25,000 to the Bureau of Standards to standardize and report on certain materials for fire protection and prevention.

Mr. Guerin seconds motion.

Dr. Rosa: I don't wish to speak either in favor of or against this motion, but I suggest that the sum be omitted. That sounds like a small sum.

Mr. Holt: I wish to make that point also. We had this up with the Department of Commerce and their estimate for this work was from $250,000 to $300,000, not $25,000. But they thought it was a proper thing for the Government to undertake this; for the Government, as the largest user of structural materials in the United States, had the largest single interest in it. The information which Dr. Rosa has already mentioned is necessary for any bureau to properly pass upon many of the questions concerned, and the Department has already recognized this; but while I think its estimate is high, I don't think we could get far with $25,000.

Mr. McDowell: I wish to amend my motion to $350,000.

Mr. Holt: I wish to speak on that. It is no laughing matter. If done by the States themselves it would cost a great deal more than that. If the States contributed their share of the cost respectively to care for this problem together it would cost far less and go farther than if they investigated separately, and the work would result in a vast improvement and benefit to the people as a whole.

Mr. Guerin: I second the motion made by Mr. McDowell, amended to $350,000.

Mr. Goddard: I think the whole question is before the Convention and also the amendment. It seems to me it is one that not only is worthy, but requires a considerable amount of consideration and discussion before we register an opinion as to the details of accomplishing the purpose which, I take it, is in the mind of the Chairman and with which we are unanimously in accord, that is, the reduction of fire waste in life and property. There are two questions—one of the standards themselves and the other the question of the authority back of those standards. The first division appeals to me most, because I always feel that the method of accomplishing a result, provided it is decent and honest, is of very secondary importance to the result itself. What this Convention is after, and what every public-spirited man is after, is a good result. There is no problem but what the weakest link of the chain determines the strength of the chain. I think our engineering friends present will bear me out in the statement that the factor of safety in engineering problems is, to the public mind, ideal.

If we go back a few months and look out over the Atlantic Ocean we would see a steamship which was the pride of its owners but which was equipped under minimum compulsory standards. On 90 per cent. of occasions we would have felt safe in relying on its water-tight bulkheads without considering the lack of lifeboats. But the occasion of the other 10 per cent. occurred and with it the loss of the *Titanic.* The builders and owners concerned were satisfied to take the chances of the 90 per cent. and in the rare emergency much life and property were lost.

Consider also the need of a standard hose coupling. How often do we require assistance from other towns? It is the exception; but when it comes it is important. I believe it is always better to strive after the economical rather than after the too ideal, which you know you cannot get; but there is a line somewhere which it is fair to draw in this matter—fair to insurance interests and fair to the public. Sometimes the public does not know what is best for themselves. On repeated occasions I have had the public come to me and say: "Why didn't you tell me that if I spent a few more dollars and put in a better equipment I could have in the end saved money?"

It seems to me that this is not only a question of principle; it is a question of detail which needs very thorough, careful and unprejudiced investigation and consideration before we come to the opinion of this Convention on those details, and it is worth it. It is an important question—the public opinion that is coming to our aid to make compulsory upon the public the protection of their property in such a way that it will not be a menace to their neighbors. And that compulsion should be reasonable and should be to the best interest of the public as a whole. It should not consider private interests. We don't ask that. But it should consider the public and be sure that the advice given the public is the advice which will be best for them not merely to-day or to-morrow but for all time—for the future; and it is not always the cheapest thing that is the best. When we are running an electric light line and we choose to balance copper against cost, it is purely a question of material things. When we are running a life line and are balancing material against life, it is not a question of material things: that is the time we want that life line, no matter what the cost, to be always efficient. We can't balance up dollars against human lives. Now I am not dwelling on the details as to how high the requirements should be or how low, but solely on the general proposition that we want to be sure that when we register our opinion on a matter as important as this is, that it is something about which we may not feel next year ashamed of the responsibility we have taken. We want compulsory minimum requirements all carried out properly in every building.

After the fire occurs you may say: "Perhaps the floors were crowded or littered, but not once in a hundred years such a fire would come." Not in 90 per cent. of cases, perhaps, but it is the 10 per cent. that costs the lives; and before the fire, if you had insisted on picking up the scraps, prohibiting smoking by clerks, and the dozen other things that seem so small before the fire comes, they would have said you were unreasonable. But the important thing for this Convention to consider is that they are sure, when they register their opinion, that they will not have to regret the responsibility they have taken. When it comes to a question of deciding a theory of standards as to approval, we don't know that Congress will appropriate three hundred and fifty cents; we don't know that the Bureau of Standards would be willing to take it up or have the time to do so: but we do want the best thing we can get. For that reason it seems to me this resolution should be whipped into shape so that it will express an opinion which will be endorsed by every man present when he stands here, as I believe we all do, in the capacity of citizens of the United States—not as the representative of any municipality or underwriters, not as the representative of any manufacturer, but simply as citizens. You can't get a body of men like this to come to Philadelphia and spend a week in discussing business interests. I believe everyone is actuated by a higher motive than the business question. We want to do the right thing and what will, in the end, prove to be effective and bring about good results. I don't want to make any motion but to throw out the thought that whatever we do should be the thing we mean to do and the best thing.

Mr. Evans: If I may be permitted to make a couple of remarks at this juncture: I think Mr. Goddard has spoken admirably. In one instance he more than sustained my point of view, although I think he meant to repudiate it. The trouble with the *Titanic* was that it did not comply with compulsory minimum standards. Six months before she went down it was common talk in New York City that a tunnel should not be made out of the lower decks. There should have been ample transverse bulkheads, and if she had been built as her sister ship is now being rebuilt she wouldn't have been sunk by that accident. That statement is based on information from a naval officer.

About this matter of standards, as far as I am responsible for it, I would say that these standards may not be lower than anything we have now but possibly higher. I believe in the standards which are good for all parties instead of for only some of them. I plead for standards which are based largely on the present ones, because those who produced the present standards will probably produce all future ones.

But I want the point of view of all the interests—governments, manufacturers and public—as well as the underwriters. If it depresses insurance rates, let them be depressed. I am trying to find out if it isn't possible to get an opinion on all existing experience produced by the highest authority legally extant, if it sees fit to do so, instead of unofficially, which cities and States can adopt without any question of any special interest.

One final word: the illustration of the Thomson law for current lines for economy did not take in purview any life hazard, as Mr. Goddard has properly stated; but I want to call your attention to the fact that the insurance standards have not heretofore taken into purview the life hazard to any great extent and that is why some unrest is attached to them.

MR. MERRILL: I wish to have the Record show that I thank you for the opportunity to parallel your statements. I fail to understand one error in the statement of the gentleman from Pittsburgh. Pittsburgh has been welcome to any data we can give, and if they did not get that data it was due to a misunderstanding as to who the gentleman was or for whom the data was wanted. He is welcome to any information as to any device or test of any material made.

Two days ago I spent an entire day urging the establishment of a Government Bureau of Fire. The insurance companies are by no means anxious to spend all the money spent in this effort. The station at Chicago is costing and has cost a considerable sum; what is needed is a parent-testing laboratory under Government auspices—they have advocated it and it is a matter of public record in Congress. I have taken the matter up with Dr. Stratton. I suggested to him the appropriation of half a million dollars. He thought (as also I regard it) that this was the minimum needed for comprehensive work of that nature. I am very happy that the Government has appropriated for two new bureaus—$25,000 for one, and $15,000 for the other; and we will get splendid light as to electrical installations, etc. There is difference of opinion between President Wilson and others as to where the work should be lodged. I am heartily in favor of this general course of action, and always have been; but I don't think the best way to bring it about is to criticise other than with extreme caution the institutions already existing for the purpose.

MR. GODDARD: I would like to say that I think it will expedite matters on this difficulty, when it comes to a vote, if we take up separately the two heads: First, that we include under A the question of standards, and then that we include under B the question of methods. I think that is a fair proposition because there may be some of us who may be ready to vote in favor of one and against the other, or in favor of both, or in favor of neither; but to give the question a fair showing before the house I would ask that when the question is put it be divided and not put as a whole.

MR. McDOWELL: If there are no speakers on the amendment I would like to have the closing word—to say that the proposition I submit in the amendment is that the Bureau of Standards in this appropriation shall proceed to determine values. The enforcement of these on the public, as I take it in this resolution, is a part of the duty of the city or State, and the fact that the Government makes the standards does not automatically put them in force throughout the United States, but it rests with the State or municipality.

But we want a yardstick that is 36 inches long and we want to know that those are standard Federal inches not cut off in some portions of the country. The only objection to the private laboratory, or semi-public laboratories, is that they have no legal standing. The only basis for accepting their decision is the consensus of opinion that they are right. However, if we have a Federal Bureau of Standards, the right to question its measurements would be a matter or review with that bureau and not for general discussion or quibble. That is why I ask for the Bureau of Standards to set these values for us.

Now, one word about the Underwriters' Laboratories, Inc. I took up that particular matter heretofore mentioned with Mr. Merrill. The report of the Laboratories was contained in something like 100 pages, but in no place in the report were the facts of the defects of the material in any way alluded to.

MR. EVANS: I think it is pertinent here to read some correspondence between the city of Cleveland and the city of Philadelphia on this subject:

CITY OF CLEVELAND
DEPARTMENT OF PUBLIC SAFETY
DIVISION OF BUILDINGS

NOVEMBER 22, 1912.

CITY ELECTRICIAN,
Philadelphia, Pa.

DEAR SIR:

I wish to enlist your aid in an effort I am making toward the establishment of a National electrical testing laboratory to be operated by the Federal Government.

As you are well aware, municipal electrical codes provide rules for only the wiring and installation of electrical equipment. But the safety of an installation depends not only on the method of doing the work, but also on the quality of the supplies and fittings used. The most available information now to be had concerning the quality and safety of electrical fittings consists of the findings of the Underwriters' Laboratories. Hence, in safeguarding electrical installations against faulty equipment, municipal inspection departments, in the absence of other information, are forcing the findings of the Underwriters' Laboratories. These findings on electrical fittings are either positive approvals or rejections. The enforcement of these findings by municipal and sometimes State and Federal inspectors is uniformly rigid. The result is that the Underwriters' Laboratories dictate absolutely what electrical equipment shall be used by the people of this entire country; and the dictates of this private corporation, which is in no way controlled or supervised by the Government, are enforced absolutely by Government officials.

Without questioning the integrity of the Underwriters' Laboratories, I believe that this is a condition that is entirely wrong in principle. That public officials should enforce the mandates of a private unrestricted corporation, whether through choice or necessity, is entirely against our ideas of right. Furthermore, this action by public inspection departments places a tremendous power in the hands of the Underwriters' Laboratories to discriminate between manufacturers. While I do not claim that this discrimination exists, nevertheless the easy possibility of such discrimination does exist.

I believe that the best solution of this difficulty lies in the establishment by the Federal Government of a testing laboratory whose activities shall parallel those of the Underwriters' Laboratories. City or State laboratories of this character are undesirable because of the expense, the unnecessary duplication of work, and the diversified findings that might result, which would handicap the manufacturers of electrical equipment. The acceptance of the findings of such a laboratory need not be made obligatory upon cities or States. To obviate any legal difficulties the laboratory may be established for the ostensible purpose of determining what equipment is suitable for the use on Government work. The findings of this laboratory can then be legalized by any city or State that care to do so.

I furthermore believe that the establishment of such a laboratory would encourage small manufacturers, stimulate competition, and bring down the prices of some lines of electrical fittings.

The difficulty might also be solved in another way, if the Underwriters' Laboratories should consent to Government supervision. The Government control and supervision of these Laboratories would justify the enforcement of their findings by municipal inspection departments.

At any event, whether you are against it or in favor with it, or have any suggestions to make, let me hear from you.

Respectfully yours,

M. SARBINSKY,
City Electrician.

ELECTRICAL BUREAU
PHILADELPHIA

MR. M. SARBINSKY,
City Electrician.
Cleveland, Ohio.

NOVEMBER 29th, 1912

DEAR SIR:

I read with a great deal of interest your letter in regard to the establishment of a National laboratory to parallel the work of the Underwriters' Laboratories. I quite agree with you that such a laboratory if started must be under the National Government and not a State or city affair, and I presume that the Bureau of Standards would be the proper organization to carry on such work if it would be authorized by Congress.

If there were no Underwriters' Laboratories in existence there would be no question in my mind about the desirability of the Government undertaking this work. With the Underwriters' Laboratories existing, the question in my mind is, first, whether they are doing the thing justly, and, second, whether they are doing the work properly. If both these questions are answered in the affirmative I do not feel very strongly the benefit of duplicating their work. So far as my own experience goes, it has led me to feel that the Underwriters' Laboratories were both just and efficient. That perhaps may be brought about by the fact that the head of the Laboratories was in the same class with me at the technical school, but I have never heard any criticisms from others upon the work of the Laboratories, so that there has been nothing to disturb my natural favorable impression. I judge that you have not had such a favorable experience, and if I can be convinced we need a replacement or supervision by the Government I should be glad to join you in the effort to bring it about.

We are considering here the question of an ordinance which will provide for putting underground every year a certain amount of overhead construction work. I should be glad to receive any information that you can give me in the way of State laws or city ordinances, or your own regulations which bear upon this question.

I would also like to know the maximum voltage which you allow on your streets on overhead work, and whether this is stated by an ordinance or by departmental regulations; and in the absence of such I would also like to know how you personally feel upon the matter. There must be some limit beyond which it is unwise to go in the matter of this overhead voltage, and it is only by a consensus of opinion of the officials in the principal cities that such a limit could be fixed upon. Very truly yours

CLAYTON W. PIKE
Chief of Bureau

MR. CLAYTON W. PIKE
Chief of Electrical Bureau
Philadelphia, Pa.

DECEMBER 3, 1912

DEAR SIR:

I am in receipt of your valued favor of the 29th ult. With reference to the establishment of a National testing laboratory I must beg to differ with you when you say that if it be found that the work of the Underwriters' Laboratories is properly and justly performed then there is no need for a National testing laboratory. Admitting for the sake of argument that the work of the Underwriters' Laboratories is both proper and just, it is still wrong in principle that public officials shall enforce the rules and findings of a privately owned and controlled corporation.

Furthermore, the intention of the Underwriters' Laboratories is merely to decrease the fire hazard. There is, however, a life hazard which is distinct from the fire hazard and which should be considered in making tests. This life hazard naturally the Underwriters' Laboratories do not pay such serious attention to, because their primary aim is to protect the insurer.

Another argument which should be taken into account is this: There is a large difference in opinion as to what kind of fittings shall be used. The insured naturally desires the most economical fittings. The insurers on the other hand always desire the safest fittings, which are usually the most expensive. I believe that the right is at neither extreme, and that the determination of the proper material to be used should be left to a neutral and disinterested agent, such as the Government. At the present time the decision is left with one of the contestants, the insurers, which is naturally unfair, and the verdict of one of the interested parties is carried out by us as public officials.

As you correctly surmise, our experience with the Underwriters' Laboratories has not been the most favorable. I have at various times heard complaints against their methods of procedure. I have not investigated these complaints, nor have they been from such authentic sources that their truth could not be questioned, but they have brought home to me the possibility of the easy existence of partiality in an institution managed like the Underwriters' Laboratories. I urge a Federal laboratory therefore, not because I believe that such partiality exists, but because the possibility of it exists, and because the principle under which we are now working is entirely wrong.

I trust that these considerations will win you to a support of this movement, and if so, I trust that you will make this known by a letter to Dr. Stratton, Director of the Bureau of Standards at Washington, and to such Congressmen as you may have influence with. I should also be pleased to hear from you further on this subject myself.

With reference to your queries I could answer as follows: One of our city ordinances requires that within a certain district of the city every company operating pole lines shall each year put underground at least two miles of such construction. The two miles to be put underground may be designated by a board composed of the Director of Public Service, the Director of Public Safety, and myself; or, in lieu of such designation, the company may put underground any two miles that may be necessary for the maintenance of its plant.

With reference to the maximum voltage permitted in overhead work on the streets, we have no city ordinance or State code limiting such voltage. The highest voltage we have on our streets here is about 6500 for arc lighting. Primary distribution is at 2300 volts. Inter-substation distribution is at 11,000 volts, but this is all underground. It is my personal opinion that 7500 volts is the maximum that should be permitted on streets, and even the use of this should be safeguarded by requiring sufficient minimum size of wire, separation from other wires, safety at cross-overs, etc.

I trust that this gives you the information you require.

Very truly yours
M. SARBINSKY
City Electrician

MR. C. J. DOYLE (Springfield, Ohio): It occurs to me that there has not come before us a question of more far-reaching importance than this question of this morning. I think we are all agreed upon the suggestion of blazing a new path, or extending those paths of progress we have already made with reference to standardization. The subject is of such vast importance that it is worthy of the best thought of every member of this Convention. It seems to me that, unfortunately, this great question of this morning has been sidetracked and other matters scarcely collateral to it have been brought into the discussion.

As I understand the question before this Convention now, we are asked in a few moments to vote upon this important matter; and yet in the order of things we would first have to vote upon the question of the amendment asking Congress, to that end, to appropriate $350,000 on the assumption that this final authority was to be lodged in a department of the Government. We must first vote upon that amendment whether or not we request that Congress shall appropriate this sum. Then there has been the suggestion that the resolution be divided and that we vote on A and that we vote on B.

In my judgment, the minimum scale in anything soon becomes the maximum scale. If you will pardon the personal reference, I have had something to do with executive matters as mayor of my city, and afterward as fire marshal of Illinois. I soon found that personal, political, and every other sort of pressure was brought against these departments by men whose property we tried to raze in order that the very minimum of compliance might in their instances be the maximum of compliance.

In order that this Convention may ultimately take a stand either upon the enlargement of this resolution or its modification, and in order that the best thought may be centralized in this, and that we may have the question presented in a concrete form, I move, Mr. Chairman, as a substitute for all motions now pending before the Convention, that this resolution be referred to a special resolution committee of seven to be appointed by the Chair; and that this special resolution committee report back to the Convention a resolution which, in their judgment, or a majority of them, should be the conclusion of this Convention; and after we have their best thought it will be a question for the Convention to adopt or not. And after all we will be the personal judges of it when it is offered in a concrete way and not in a confused manner. I move that as a substitute for all pending motions.

Mr. Evans: I do not think that such a motion is in order as a purely parliamentary question so long as the other motion has not been voted down. While the conference as carried on here has progressed, it occurred to me that the same course of action as obtained in respect to building codes yesterday would be best; that is, to have informally the men interested in this matter constitute themselves a committee, if it would be permitted by Mr. McDowell and Mr. Guerin; and instead of putting this to a formal vote, I believe we would get better results by this informal committee taking the matter up and then presenting their conclusions to the Convention.

Mr. McDowell: I believe that the way of the gentleman from Illinois is better—that the whole correspondence should be included for consideration by the committee; and I withdraw consideration of my own motion and second his.

Professor Woolson: I would like to offer a suggestion for the consideration of this proposed committee. I am heartily in accord with anything that would raise the standard of requirement for protection of life and property, but it seems to me we are going rapidly here and perhaps we should apply and get some outside advice before we request Congress to appropriate a large sum of money for a thing of this kind.

My reason is that the Underwriters' Laboratories are not the only institution in this country formulating standards for building materials and construction. There is the American Society for Testing Materials, which formulates standards for all kinds of building materials, including fire-resistant construction. There is also the American Society of Mechanical Engineers, which has a committee on the subject of fire-resistant construction. Then the American Society of Civil Engineers have been pioneers in the work of fire-resistance and, in fact, they conducted the first tests made in any country on the subject. These are all organized societies with hundreds of members. Here, as I understand it, is a temporary organization, and it seems to me a bit rash to formally request Congress to appropriate a large sum of money for carrying on that investigation or determining certain results in this way with only limited discussion on the subject. It may be perfectly proper. I am not questioning the object to be attained, but I think we are a little hasty in going ahead and delegating to ourselves this important function when there are other large organizations of years of standing in this country that might have a desire to say something on a matter of this kind. I think that consultation should be had with these other organizations which make and promulgate standards, many of which are in use throughout the country.

Mr. Evans: Professor Woolson, the very fact you speak of demands speed. We are here as as a temporary organization, for this once, perhaps. And we want to better conditions that for twenty-five years have been wrong. Where are we getting in this matter? Merely registering a suggestion with the National Government that an appropriate amount should be expended to investigate this thing. The American Society for Testing Materials can go there and be heard. We want merely to devise some means whereby everybody may be heard. One word now in answer to the thought advanced that destructive, not constructive, criticism has been employed here to-day. I quite agree with any view that iconoclasm is one of the worst things in life, but I believe that aiding the Underwriters' Laboratories by a court of appeals is helpful; and I was careful in talking the matter over with the Federal Government officials in Washington not to suggest that the work already done is not good, but merely of the necessity of regulating it.

Mr. S. G. Webb (New York): I want to talk on one phase of the question of standards, dealing with the fire and water tests of structural materials. Taking the so-called fireproof building only in consideration, and eliminating the exterior wall, we have left for consideration the materials for the floor, the elevator enclosure, the protection of sill, the roof slab and the partition. References have been made to existing testing specifications. Taking the floor question, the American Society for Testing Materials and the National Board of Fire Underwriters have practically identical test specifications of 4 hours fire, 1700 degrees F., 10 minutes water, 1⅛-inch nozzle, 60 pounds pressure. When we come to partitions, however, the American Society for Testing Materials has one standard of 2 hours fire averaging 1700 degrees, 1⅛-inch nozzle, 30 pounds pressure, and 2½-minute water application; while the National Board of Fire Underwriters has almost identical specifications —the same as to fire, but with ⅞-inch nozzle and 50 pounds nozzle pressure, the water application being for 5 minutes.

Those, as far as I know, are the recognized standards under which the country at large is testing building materials for adoption in cities and States. The question of the appropriate specification for the improved enclosure of elevators and stairways has been the subject of considerable discussion and consideration, but nothing, so far as I know, has been determined. The test will probably land somewhere between 3 and 4 hours fire, 1700 to 2000 degrees of temperature, with probably 10 minutes of high pressure water.

The same remark is true of the important question of the fireproofing of structural steel members. I believe that matter has been under very serious consideration, but, as in the case of elevator enclosures, nothing definite has been arrived at in the way of specifications.

As far as roofing slabs are concerned there are no specifications. Now, limiting my remarks purely to the structural features of the building of the so-called fireproof class, this seems to give the story of the specifications that have received more or less authoritative endorsement and general acceptation. Beyond that we apparently have nothing, or next to nothing, in this field.

So much for the moment about the so-called fireproof classification; but what are we doing about the enormous amount of construction not classified as fireproof? I want to present the thought for the consideration of the Resolution Committee you have just appointed, that it consider very seriously the plan adopted by the British Fire Prevention Committee in 1903, and subsequently endorsed by the International Fire Prevention Congress which met that year in London. In other words I advocate the adoption here of standards that in principle were then adopted by the entire civilized world, other than the United States and Canada. Unfortunately, we are arriving rather slowly in this county at an appreciation of the fact that the word "fireproof" is generally incorrectly used. As long ago as 1903 the British Fire Prevention Committee promulgated, in the 1903 Fire Prevention Congress, a correct definition on that subject. If I may be permitted, Mr. Chairman, I will read the following data into the Record, as it may be of value in the numerous copies of our proceedings that will be sent out broadcast:—

"UNIVERSAL STANDARDS" ADOPTED AT THE INTERNATIONAL FIRE PREVENTION CONGRESS, LONDON, 1903

Re the term "fireproof," the Congress having given their consideration to the constant misuse of the term "fireproof" and its indiscriminate and unsuitable application to many building materials and systems in use, have come to the conclusion that the avoidance of this term in the general business and technical vocabulary is essential.

Re the term "fire-resisting," the Congress considers the term "fire-resisting" more applicable for general use, and that it more correctly describes the varying qualities of the different materials and systems of construction intended to resist the effect of fire for shorter or longer periods, at high or low temperatures, as the case may be; and it advocates the general adoption of this term in the place of the term "fireproof."

Re "standards of fire-resistance," the Congress confirms the British Fire Prevention Committee's proposed standards of fire-resistance, and hereby resolves that the universal standards of fire-resistance shall in future be—

1. Temporary protection
2. Partial protection
3. Full protection

in accordance with the Committee's schedule.

The general principle adopted above was that all classes of construction—all materials and construction—should be divided into three broad classifications known as *full, partial* and *temporary protection.* They went a little further and subdivided each of those major classifications into two minor classifications, known in each case as A and B.

Now we in this country are suffering from an appalling loss of life and property. Our property loss isn't all in the figures we are so familiar with—upward of $2.50 per capita. In addition to that there is the life loss. I don't know to what extent the adoption of these principles abroad, in Europe particularly, is responsible for the fact which we all know—that the property loss in the principal European countries averages about 30 cents per capita—but it may have some influence upon that result. Whether it does or does not, that classification appeals to me as logical, scientific and sensible, and as a very good example for us to copy and for this Convention to endorse—I mean the broad principle of classifying properly all construction instead of narrowing it down to the 5 or 10 per cent. now commonly known as "fireproof."

MR. DOYLE: The Chair originally started to put my motion, which was properly before the Convention, seconded by Mr. McDowell, when Professor Woolson spoke in reference to the motion, and I understand the motion has not yet been put.

MR. EVANS: I will put the motion now as to the appointment of this committee.

Motion carried, and the following committee appointed: Messrs. McDowell, Guerin, Doyle, Clark, Cole, Goddard and Merrill.

MR. MCDOWELL: Will you call a meeting of this committee?

MR. EVANS: I request that the committee just named meet as promptly as convenient, at the call of Mr. McDowell, chairman, and report to-morrow morning. We will then act on the report and incorporate the result in to-day's record. Are there any other remarks on this subject? If not please remember that motors are waiting at the door to take you to Belmont Mansion in Fairmount Park, where we take luncheon as guests of the Department of Public Safety of the city.

A motion is in order to adjourn until to-morrow morning at 9 o'clock sharp.

Motion carried. Adjourned.

CONCLUSION

(From subsequent proceedings)

MR. EVANS: The first business this morning is upon Topic 8—"Compulsory Physical Standards"—and I will ask for the report of the Special Committee on the resolution.

Mr. McDowell reads report of Special Committee and moves the adoption of the resolution they recommend.

Motion seconded by Mr. Goddard and also by Mr. Hexamer.

MR. EVANS: If there are no further remarks I will say that, as far as I am concerned, this action constitutes what seems to me an admirable first step to cover the ground that ought to be covered. It will take further concerted effort (and the more concerted and wider it is the better) to put it out with sufficient force to get somewhere. I am fully in favor of it personally. I take it there is no objection to having a copy of this resolution sent at once to all concerned.

On vote motion was unanimously carried.

Resolution as Adopted on Topic 8

"It is the sense of this Convention that:

In view of the growth of State laws and municipal ordinances to prevent the appalling loss of life due to fire and to control fire waste by the widespread legal imposition of physical requirements upon the construction, protection and equipment of buildings, it is now important that:—

(a) Physical standards on this entire subject be formulated which may be generally and legally imposed without undue hardship or cost upon the public; and

(b) That the Federal Government through its Bureau of Standards of the Department of Commerce should arrange to review such standards for approval and promulgation in uniform language to the end that they may be used by States and municipalities in laws and ordinances; and therefore be it further *Resolved:*

(c) That the National Fire Protection Association be requested through its Executive Committee to arrange for a conference of delegates, with the chairman of this Convention as chairman, from the American Society for Testing Materials, the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers, and all kindred national societies having standards bearing on this subject, for the purpose of collecting such standards for submission to the Federal Government; and be it further *Resolved:*

(d) That the conference thus formed be requested to take the necessary steps to bring these resolutions before Congress and to secure the required legislation at the earliest opportunity."

THURSDAY MORNING SESSION

October 16, 1913

Topics 9 and 10—"Occupancy" and "Annual Occupancy License"

NOTE.—Every use or "occupancy" of any building contains in itself an inherent fire hazard to that structure and its contents in life and property, and also to its environing community; hence consideration here of this danger in completed buildings.

The meeting was called to order by the Chairman at 9.25 a. m.

MR. EVANS: The next topics before us are numbers 9 and 10 under the tentative resolutions announced. These follow the same routine as the others which have preceded, Topic 9 covering the *unit* building more particularly, while Topic 10 embraces some of the considerations of *general* occupancy control in communities. "Occupancy" is not intended here to mean the manner in which people live in buildings, but the nature of the pursuit that is carried on in any building. Mr. Lawrence Veiller, of the Charity Organization Society, New York, who was to have joined in the next paper, has been so much occupied recently with completing arrangements for the Convention on Housing to be held shortly that he was only able to confer briefly with the writer of this paper, Mr. Gasser, who will now read it.

"OCCUPANCY"—I

By Mr. C. Albert Gasser, Chief of Bureau of Combustibles and Fire Risks, Newark, N. J.

I think you will agree with me when I get through that my paper will at least have the one merit of being the shortest of the Convention. I was limited to 1000 words in the invitation, and made it 800. I will explain this by stating that it may not be as technical as you expect, but it is based on experience. I trust that in the discussion I may perhaps be permitted the extra 200 words.

Admitting first the vital need of municipal control over hazardous occupancy, there follows naturally municipal regulation.

I desire to direct attention to methods prevalent throughout the country directly responsible for much of the Nation's fire waste—methods which, uncontrolled, have enabled individuals or corporations to begin business without asking permission of any authority. Rapid growth increases fire hazards almost imperceptibly until conditions are reached which are dangerous not only to the individual industry concerned but to surrounding property. Then laws and ordinances are enacted and inspectors are sent out to find violations, or inquests and investigations follow tragedies due to carelessness.

I believe this system to be fundamentally wrong and submit an opinion of what can readily be done in every State in this country.

I believe that every business should be licensed by State authority. Any man or firm contemplating going into business should be compelled to apply for a license, such application to include:

Names of owners of business
Names of owners of buildings
Description of physical properties of buildings and surroundings
Nature of business to be conducted
Number of employees (sex specified), and
Materials used or manufactured.

Applications to be approved only upon compliance with all regulations, laws or ordinances; licenses to be renewed annually and to be subject to forfeiture for violations; fees to be nominal, not exceeding $1 per annum; regulations to be based, of course, upon scientific knowledge of each separate industry; licenses to be forwarded to municipal authorities and to be then issued if there be no other than State regulations.

One great peril is found in the fact that employees build their homes around their occupations, and hazardous conditions progress until a meadow becomes a village and a village a city. Shall the successful cellulose products company or the successful explosive industry be then driven from the community to begin the series elsewhere? Surely not!

The regulations upon which licenses would be based would provide that a cellulose products establishment must be in a one-story fireproof building not more than 25 feet by 50 feet and 20 feet from all other buildings; or 25 feet by 75 feet and not less than 30 feet distant; or 100 feet by 100 feet, at least 100 feet away; that a two-story building must be of fire-resistant material with outside fire tower, etc.

Licenses for the storage of volatile oils to be based upon regulations providing that not more than 500 gallons may be buried in one tank 6 feet from a building, or other tank, and 3 feet underground; 1000 gallons 20 feet away; 10,000 gallons 100 feet, and so on in just the same manner in which New Jersey regulates the manufacture and storage of dynamite and other high explosives.

State laws should require State licenses under State regulations to be vizèd and issued by municipalities.

Automobiles are licensed, theaters are licensed, the liquor industry is licensed, and in each such field we find strict regulation possible.

In the line of efficiency and economy such license system would reveal conditions and statistics of inestimable value and accuracy to departments of labor, of vital statistics, boards of trade, census bureaus; and, most valuable of all, accurate information for the public.

Licenses regulate, while *inspections* irritate.

Consider a careless manufacturer who is making money. In the event of accident or fire he passes the burden to the insurance companies, hires counsel in the event of fatality, and gets a verdict of "no one to blame." Hold over such a man the threat that his license to do business will be revoked and results truly magical will follow. This is not a theory but a fact.

No extensive department need be created to carry out this idea of licenses. It may be placed in departments already existent, as for instance, the State fire marshal, the insurance commissioner or the commissioner of labor. It is definite in its operation. Inspections are based upon applications and are the more thorough because something vital depends upon such inspections.

Redress could thereby be secured and dangers quickly eliminated. Regulations would include recommendations of city plan commissions; or commissioners or officials in charge of police, health, building or safety bureaus. There would be fixed responsibility. Uniform regulation would be possible.

The subject of "Occupancy" is thus treated briefly. Details are impossible unless many industries be treated separately and at length.

I therefore recommend, squarely and without quibble, that the "Occupancy" hazard be controlled by State or municipal license.

MR. EVANS: Next there will be two papers by Messrs. Charles A. Hexamer and Edwin Clark, respectively, both of Philadelphia, and Mr. Hexamer will present them. He has been an engineer of note and interested for so many years in this whole field—the first president of the National Fire Protective Association and continuing in that office several years — that his opinion is authoritative. I now introduce Mr. Hexamer.

MR. HEXAMER: I will first read the paper prepared by my colleague, Mr. Clark.

"OCCUPANCY"— II

By Mr. Edwin Clark, Chief of the Bureau of Building Inspection, Department of Public Safety, Philadelphia

The subject of occupancy of buildings is one of vital importance to man, as upon the proper housing of himself and his effects depend in large measure his health, comfort and financial success.

Occupancy of buildings may be divided into two classes: ***human*** occupancy and ***material*** occupancy.

Human occupancy deals with the physical building and involves proper and safe construction, heating, lighting, ventilation, proper exit facilities in cases of emergency, and safeguards for machinery, elevators, etc. It is absolutely necessary that a building, when constructed, should be safe against failure, and that it should have a proper margin of safety for deterioration as well as for incipient fire. Proper heat must be provided to insure comfort; sufficient light must be obtained so as not to impair the eyesight; and proper ventilation is necessary to maintain healthful conditions and not befog the brain and injure the general health.

Sufficient exits must be provided for cases of emergency, such as accident and panic; and safeguards for machines, openings in floors, stairways, etc., installed. The insidious influence of improper ventilation and unsanitary conditions, coupled with poor light, has caused, and is causing, a greater loss of life than any or all of the other above-named conditions. Laws should be specifically and amply drawn to properly cover these conditions. The large corporations are realizing the great advantages gained, not only to their employees but also to themselves, by providing suitable environment for the employed, as more and better work is performed under proper environment, and are erecting model buildings in this respect. This is being done of their own volition, as the laws are very lax; in fact, in many instances there is no provision for the heating, ventilating or lighting of buildings. Owing to this inadequacy of the laws, men with insufficient means, or men who are unprincipled, may take advantage of the present lack of proper regulation and erect a building, or occupy one, that is not adaptable to the health and comfort of their employees.

The question of proper exits from buildings in times of panic deserves careful consideration; and the provision of tower fire escapes, to insure proper exit in case of emergency, as well as the division of all buildings with at least one division wall, should receive close attention.

Material occupancy deals with the character of the material manufactured or stored; and upon the safeguards that are thrown around it in its manufacture or in its storing depend largely the safety and financial success of the individual and his neighbors and the community at large.

Some of the safeguards for material occupancy are the character of the construction of the building; division walls dividing the building into proper sized areas with properly protected openings; an efficient sprinkler system, with minor appliances; and the protection of exterior and interior openings in light, stair and elevator wells with wireglass and metal frames.

Proper zones should be delimited in which certain classes of manufacturers may house their stores or manufacture their wares. Specially hazardous material should be restricted as to the character of construction of the building, division walls, sprinkler systems, etc., and should be located in zones that are not congested.

The control of these conditions can be obtained in but one way, that is by act of legislature requiring the procurement of an occupancy license and for thorough and frequent periodical inspections; such license not to be granted until the conditions as set forth in the act are complied with. Laws should be so definitely drawn that proper division in planning is made mandatory. Certain zones should be required to have a specific form of construction. Certain manufactures and the character of the materials stored should be restricted to buildings of definite kinds of construction, located in zones adapted to the conditions. Means should be provided in buildings to check incipient fires, and special safeguards thrown around conditions that are fire-breeders, by segregation of that portion of the building by fire-resistant construction having window openings protected by metal frames and wireglass, and the introduction of efficient sprinkler systems.

"OCCUPANCY" AND "ANNUAL OCCUPANCY LICENSE"

By Mr. Charles A. Hexamer, Secretary Philadelphia Fire Underwriters' Association

This paper has been submitted both to Mr. Clark and my other colleague on the committee—Mr. Stockwell, head of the local Mutual

Insurance System Inspection Bureau. I have a communication from him accepting the paper as submitted and stating that it accorded with his views; as well as a similar statement from Mr. Clark.

Resolution 9—Topic "Occupancy"—assigned to us for the purpose of preparing a paper descriptive of the trend of the resolution similar to the resolution itself, can be divided into two parts: first, the subject of the "occupancy hazard of a given pursuit and its relation to surrounding buildings creating a possible *conflagration* hazard," and, second, the "physical occupancy hazard of *individual* pursuits."

FIRST SECTION OF RESOLUTION

It must be admitted that city planning laws or building codes have been, up to the present time, rather deficient in regulations controlling the broad occupancy hazard, and as a general rule entirely innocent of any attempt to control the narrow occupancy hazard of individual pursuits.

While attempts have been made by law to prescribe fire limits in which, for instance, frame buildings in cities cannot be erected, the general principle of zone restriction of hazardous pursuits has never been attempted. In Boston, if our recollection is correct, an attempt to limit buildings of other than fireproof construction to certain zones was severely attacked on the principle of zone legislation, necessitating a decision of a higher court to the effect that zone legislation, as above indicated, did not interfere with the legal rights of the individual.

Accident, however, has often resulted in the limiting of certain occupancy conditions to districts, without, however, as a rule, thereby in any way relieving the possible conflagration hazard. A law requiring all buildings of whatever occupancy in certain zones to be of fireproof construction, as above stated, does not interfere with the legal rights of the individual. A similar statute controlling the occupancy of buildings by zones could, therefore, also be enacted.

Restrictions in title papers as to occupancy of buildings to the property are constantly made and have not been questioned. It would, therefore, appear that a law preventing the erection of buildings for manufacturing purposes in certain zones would not be declared to interfere with the vested rights of the individual. As the conditions now exist, buildings occupied for hazardous manufacturing pursuits or occupancies can be erected in dwelling house districts, and the only redress the individual has is appealing to the courts on the plea of declaring the manufacturing or hazardous occupancy a public nuisance.

The occupancy of a building of necessity controls the fire hazard of a building, and hence the exposure hazard of adjacent property and the conflagration hazard of a district. It goes without saying, therefore, that the subject matter of regulating the occupancy hazard by law is of the utmost importance. It is also evident that in planning buildings particular attention should be given to the intended occupancy of the building, to the location of the building in reference to other occupied buildings, and to the location of the building in a district of buildings of other hazardous occupations. The safeguarding of hazardous pursuits in their appropriate danger zone is undoubtedly a subject that can and should be given consideration in city planning laws.

SECOND SECTION OF RESOLUTION

The narrow occupancy hazard, or physical fire hazard to life and property in any given occupancy as specified in the second part of the resolution, should undoubtedly be controlled by the building code. Up to the present time attempts to do this in building codes have been sporadic and confined mainly to the protection of life in such buildings where large numbers of persons may be found at any one time—such as theaters, where the construction and protection of the stage portion is usually very minutely specified in building codes; in moving-picture theaters, where the construction of the booth is specified; and in buildings where gasoline or other light petroleum products are handled.

The segregation of physical hazards of occupation has, however, been very minutely classified by regulations of the fire insurance companies, who, combining to establish and maintain rates of insurance, also establish standards for construction and protection of buildings, paying particular attention to all physical hazards of occupation which can be segregated.

For instance, some forty or fifty years ago it was quite common to locate the picker of cotton mills in the main building; the result being that small picker fires, which are of frequent occurrence, would involve the entire plant. Due to the control of the situation by fire underwriters the location of the picker has been segregated to a separate and frequently fire-resistant room or building, limited in size, restricting the amount of combustible material so that a fire involving the picker would be confined to the room or building containing the same.

The same can be said regarding the hazard of dryers, which hazard, through the control and regulation of the underwriters, has also been segregated to separate rooms or buildings, thereby eliminating from the main plant the hazard incident to this occupation. It has been the constant aim of the fire underwriters to study the physical hazard of the various occupations with a view to eliminating the same from the main buildings, so that a possible fire can be localized and confined to the smallest possible area. Regulations for the storage and use of combustible and explosive material incident to and necessary with certain occupancies has also been controlled in a like manner by fire underwriters, who, through the application of schedules prepared for measuring the fire hazard of the particular occupancy, have been able to eliminate the physical hazard by charging in the rate applicable to the entire building a fixed sum, which is subject to elimination when the segregation of the physical hazard for which the charge is made has been completed.

It is clear that an intimate relation must of necessity exist between the building code and the rating schedules of the fire underwriters, the former being a legal requirement, the latter an economic requirement. It is, therefore, desirable that in the preparation of plans for a proposed building the occupancy be taken into consideration, with a view of first complying with the requirements of the building code; and, second, with a view of complying with the requirements of the fire underwriters. Underwriters' bureaus in the large cities have made a practice of enlisting the coöperation of architects and builders to the extent of having submitted to the bureau plans and specifications of proposed buildings, so that the same can be carefully examined with a view of making suggestions, always, however, within the requirements of the building code, tending toward the lowest possible rate of insurance covering the occupied building for the specific occupancy for which the building was intended.

Up to the present time the building codes provide for a certain carrying capacity of floors varying with the intended occupancy of the building. There is no provision, excepting that which may arise when extreme changes in occupancies are made, which would require the owner of the building to increase the legal carrying capacity of the floors applying to the building when constructed to the carrying capacity of the building for the changed occupancy.

As a practical instance, let me cite the Bodine street fire, which occurred in this city a year or so ago, where some fourteen firemen lost their lives through the collapse of the floors of the building during the fire. The building, constructed under the provisions of the then building code, was probably strong enough to carry the floor load of the then occupancy—namely, the storage of scrap leather in bags. When the fire occurred the large amount of water thrown into the building, and absorbed by the scrap leather in bags, so enormously increased the floor load that the collapse of the building and loss of life was unavoidable.

Similar conditions have occurred in this city in warehouses containing bagged rags or paper, cotton and wool in bales; and, in one instance, loose cotton laid down in a picker house, where the carrying capacity of the floor would in normal use have been ample, caused the giving way of the floor when the loose cotton was thoroughly soaked with water thrown on the same during a fire.

It may be well at this point to discuss the advisability of a provision in the building code regulating the prevention of fires in buildings in a general way. The fundamental principles involved in the construction of buildings tending toward safety from fire are—first, restriction of floor area in relation to the occupancy and construction of the building; second, the restriction of height in relation to the construction of the building; third, the protection of vertical floor openings; and, fourth, the protection of outside openings where exposure from adjacent properties exist or may occur in the future.

The protection of the completed building for the intended occupancy must also be given careful consideration. It is our opinion that building codes in the near future will provide that all buildings constructed for certain classified occupancies in built-up portions of the city must by law be protected by automatic sprinklers. At a meeting of a special committee in this city, called for the purpose of considering recommendations to the building code commission appointed for the purpose of codifying and recommending changes in the building laws of the State of Pennsylvania, a recommendation was made to the effect that in the built-up portion of the city all buildings to be erected in the future for occupancy as warehouses or factories should have the first floor (provided there be a basement) constructed of some type of fire-resistant construction, with stairways and elevators leading to the basement enclosed in fire-resistant partitions and protected by fire doors; and also that the basement of building so constructed be protected by automatic sprinklers. It is our opinion that a provision of this kind embodied in building codes of our larger cities would have the greatest effect on reduction of fire losses, it being a generally accepted fact that fires in basements are of frequent occurrence, and that, due to the inability of the firemen to readily reach the seat of the fire by reason of the inaccessibility of the basement and accumulation of smoke, heavy losses occur.

In addition to the regulation for construction and protection of buildings incident to particular occupancy, it has been suggested that the occupancy of buildings be legally determined and license for the occupancy issued subject to annual renewal. Such control of the occupancies and incident fire hazard of the occupancy by annual inspection and licensing of buildings for contemplated occupancy cannot but have a very beneficial result and contribute largely to the reduction of the fire waste.

Quite as important as the construction and protection of the building for contemplated occupancy is the maintenance of the building, meaning by that the housekeeping and care exercised in the removal of waste products and the prevention of accumulation of rubbish. An attempt is being made constantly by the fire underwriters to bring about the best results in this direction through the same method as indicated when referring to the construction of the building, *i. e.*, the charging for bad conditions in the rate, the charge remaining until the objectionable features have been eliminated.

The local control of this situation has been established in some of our larger cities, notably in New York City, where a fire prevention commission is operating under an act of legislature, and in this city where a fire prevention commission has been appointed by his Honor, the Mayor. The inspection of buildings for the purpose of eliminating faults of maintenance and housekeeping, either by inspectors under the control of a fire prevention commission, or by inspectors taken from the active roll of the fire department, with authority to enforce their recommendations, will undoubtedly have a marked result in the reduction of the per capita fire loss of the communities where this method exists.

Charges in the rate made by the fire underwriters' bureaus may or may not result in the correction of the defective condition. Notices to correct defective conditions given by inspectors who have legal authority to enforce them are undoubtedly superior to the effort of the underwriters to correct defects by means of charges in the rate.

In closing, we wish to reiterate the opinion expressed in the early part of the paper—that it is imperative that the *broad occupancy hazard of a proposed building inherent in a given pursuit should be definitely controlled by law in every populous community,* and also that the *physical occupancy hazard relative to the protection of life and property in any given building inherent in any given pursuit should be controlled as to construction by the building code.*

Mr. Evans: It has been rather apparent that the two topics (in which the first thought was to divide this matter of occupancy) are so interwoven as to make the division unnecessary. This is a big, important subject—especially the governmental theory that the time has come to license buildings. I am convinced from the result of our inspections in this city, and from the study of similar results elsewhere, and from the views of men who have specialized in this work, such as the Mutual Insurance inspection bureaus, that you can no more hope to have buildings reasonably occupied with respect to life and property fire danger unless you continuously control that matter than you can expect to have the peace kept in this city by walking down to a street corner once in the morning, like a muezzin on a minaret in Arabia, and telling everybody they must be good. It takes 4000 policemen to keep the peace in this city, and it requires a reasonable force of firemen or the equivalent to keep down the fire hazard. It does not require so much expense as at first glance might appear. The Philadelphia Fire Underwriters' Association has surveyed during its many years' operation in this city only 25,000 buildings out of 375,000 in the city limits. In other words, their judgment has been that control of the core of the danger covered all that called for the expenditure of money to adequately safeguard their insurance interests. Our city inspection and reinspection service now averages five buildings a day. We have taken men from the fire houses just as we found them, and if they did not know the routine we taught them its essential elements. We have obtained substantially good results, because any intelligent man who has an honest purpose to be useful, intelligent and industrious can control the essential risk of over 80 per cent. of this housekeeping danger and of the minor equipment and occupancy hazards, and he can learn that much in a month. You don't need experts for all that range of work.

When you get to the larger problems of reconstruction of some great building or protection of some group of buildings, then you must consult the finished engineer, but for the larger part of this work any man of good horse sense, who means business, can do it if you spend about a month diligently on his instruction. Naturally, men who have been fighting fires can learn this work more speedily. That is why I advocate that these men be used; and by giving them the time you will so reduce the number of fires that they will have more time. If you inspect buildings at the rate of five a day the cost is less than a dollar a building. There is no building in the city of Philadelphia that cannot afford a dollar a year to be inspected against fire hazard. It is absurd to deny the community that much protection, particularly as one element in this matter of inspection is coming to the fore to-day, viz: the consolidation of inspection agencies in cities and States. Why should we have men going all over the city of Philadelphia to see that spigots are not running water, and then walk out of the building, when ten minutes more each will tell whether it is dirty and a fire-trap or whether a noxious cesspool is in sight? The elementary sanitation inspection, housekeeping inspection, water waste inspection and fire prevention inspection—can all be done by any good man who is clean and has a little backbone and horse sense and is taught the rudiments of his duty. If these inspection services were consolidated rationally in cities in a central inspection agency we would begin to control all of these dangers and at a minimum of time and cost. The Pennsylvania Commissioner of Labor, Mr. John Price Jackson, has just delegated to the inspectors of the fire marshal the powers of his office, and invited the fire marshal to delegate to his labor inspectors the powers of the fire marshal's office; so that if these two departments, with limited funds for personally traveling through this State, happen to have one man in this city to-day going through buildings from one department, he can now perform dual functions; and if the other department has a man in another part of the State, he can perform the dual functions there. By this means you can double the efficiency of money and men. I want to emphasize the importance of every city and State in this country laying out in some intelligent form the total scheme of inspections which they are exercising now, and looking squarely at the facts themselves as to how these gap or overlap to see how they can be made more efficient by rational consolidation.

In a big building the inspections are facilitated by the fact that the building is big and organized. An inspector wouldn't go alone through the Wanamaker building into every corner, but would go with the chief engineer, who could expedite the inspection; whereas, in a small building with mixed tenancy or inexperienced owners and occupants, the smaller size of the building would lend speed. No building would cost more than $5, everything included, to reasonably inspect it for 80 per cent. of fire hazard, particularly housekeeping.

It is wise to get the specific authority to make inspections from the State or city. Given this authority, I believe that the city or State is empowered to charge the cost of such inspections as the proper exercise of police power; but it wouldn't be empowered to make that charge high enough to produce a profit, which would be, in effect, taxation. I am satisfied that the law, in court decisions, would sustain that degree of exercise of the police power. It is not only necessary to inspect buildings at least once a year, which catches a large part of the accumulation of careless living; but it is also necessary to see that when the building is finished and ready for occupancy, or somebody goes into a vacant building, that it is not occupied by persons or property to a greater extent than is reasonable for that structure, under those circumstances and at that time; and to care for this danger fully there should be a provision that a substantial change in occupancy, whether of persons or of property, would not be permissible under the law without reëxamination at this nominal cost and the issuance of a new license.

We had an old church burned down here within a year or so which had been in use for nearly a hundred years, and was occupied as a warehouse at the time of the fire. It was not built originally for any such purpose. In addition to the property loss two men were killed. The bulk of our cities in this country are made up of buildings used for occupancies not in the original plan or purpose of the building. We are all living at higher pressure, and the buildings are living at higher pressure; they are more filled with merchandise and have more people crowded into them, and hence more control should be established over their fire danger. The occupancy license (recalled at least once a year and upon every substantial change in tenancy) would care for that. As the originator of this proposal I wish to make a record of these remarks under these topics.

MR. GUERIN: Regarding the statement as to the law in the matter, it is well settled according to the law of the United States that the State has the right to inspect and regulate business as long as there is no profit in the matter.

MR. EVANS: I would like to ask Mr. Crawford, as a lawyer, to confirm the impression I have for this State.

MR. CRAWFORD: I haven't the slightest doubt that all reasonable regulation for control of fire is within police power, in which the State may compel people to do what it directs without giving them the slightest recompense directly. As far as the matter of paying for it goes, that is purely a matter of expediency. Do you prefer to have the people whose houses are inspected pay for it by means of licenses, seeing to it that no profit is made? Or do you prefer to have them pay for it in their tax-rate? In the first instance, there might be several different licenses for different things; or they can pay for the service primarily from the proceeds of taxation through any selected method. There doesn't seem to me to be any question but that it could be done.

MR. GASSER: Mr. Chairman, I should like to have those extra two hundred words.

MR. EVANS: You may have a good many more than that.

MR. GASSER: I am sorry to say that I will have to use them to differ with you.

MR. EVANS: Quite right.

MR. GASSER: This matter of inspection by the municipality would be a very serious mistake. There are enough charges now imposed. Owners of property and firms in business are charged for inspection of electric wiring, taxes and water rent, and goodness knows where they will stop. We charge $2 a year for a private garage license—a most unpopular thing. I might as well take it off the books, because it did not pay. I want to say this, that the expenses for making these inspections comes back to the people in other ways. The legislature of New Jersey last year enacted a law which provided for a uniform schedule rate of insurance, and Mr. Atlee Brown, known all over the State, made a fixed rate for certain classes. As the result of his experience throughout the State he fixed certain charges and in Newark—with 400,000 people and about 90,000 buildings—the rate on the smaller risks was reduced 25 per cent., taking effect in the early part of this month. That was a direct result of the efforts which had been made during past years to clean up the city as far as fire was concerned. It put Newark in a class by itself, because he found restrictions there more strictly enforced; and in that way I am telling the people of the city they are getting paid for everything done in the way of fire prevention.

I find in the city of Newark that the absolutely sure way of controlling any hazard is to issue a license and have the recipient know that it may be cancelled unless he fulfils its requirements. We keep adding and adding and adding to our ordinances until we don't know where we are. If you will fix in the minds of the legislature your desire to give certain boards power and discretion to make regulations which cannot be changed except after hearing, instead of urging new and more radical laws, you will get along much farther than by putting into ordinances and laws every detail regarding fire prevention.

Also, there seems to be rather a scarcity of folks from the smaller towns here. They also are groping and fishing around for a solution of a problem which we of the larger cities have not been able to solve. A great many towns are growing up and creating streets and buildings, as is the fact even here in Philadelphia, which will take many years to eradicate. I want to call your attention to the fact that State laws are objected to by these municipalities because the question of home rule is of intense interest to the small municipality.

State laws should provide uniform regulation for all these questions of fire prevention, to be enforced by the State in all towns of five hundred or less, and after that population has been passed preferably by the municipality itself. Cities of over 100,000 population should certainly govern themselves, but not, of course, to the extent of reducing the minimum of State regulation.

Mr. J. W. Blunt (Augusta, Maine): Our fire problem "Down East" is somewhat different from that which people who live in congested centers have to face. We have found that State authorized chiefs of the fire department in communities having organized departments, and in towns not having organized departments a fire warden or inspector elected at the town meeting and paid by the town, have enforced the State regulations given by the fire marshal or State commissioner. That plan is working well in the smaller communities forming the larger part of our State.

Our plan enables the instructor to make horse sense requirements as to fire hazard, which are subject to an appeal to the insurance commissioner or fire marshal, whose ruling is final. That is, they can go to the supreme court, but must take the statement of the insurance commissioner as a statement of fact.

MR. MASON: I may be falling into the category of undesirable citizens stated by Mr. Gasser, yet I want to state the following facts about the effectiveness of fire prevention inspections by the fire department: Since Cincinnati first adopted that system about the first of May of last year, with a small section of the fire department which in the main served as instructors for the rest of the detail (so that not until July 1st was the full quota of 45 inspectors on duty daily) there has not been one fire originating, as far as I know, in that city in a cellar, basement or attic. The year before, Cincinnati had fire losses of $1,500,000; and had about 1100 fires, of which approximately 25 per cent. were in cellars, basements and attics and a proportionately greater amount of losses was due to fires not originating in cellars, basements and attics. Notwithstanding the fact that the Union Trust Company building fire occurred last year, and that the full inspection force did not become effective until July 1st, the fire losses of Cincinnati last year were 60 per cent. less than in the preceding year. These things do not happen accidentally; they are more than common incidents—more in the nature of a train of logical circumstances. That record has been continued this year. Our inspections were interrupted somewhat this summer owing to the fact that we had a street-car strike, then a teamster's strike, then a laundrymen's strike, and then four other strikes (railroad and others), engaging the attention of the police and fire departments for seven weeks; but in that time no fire originated in a building that had been properly inspected.

We have 80 per cent. of our 80,000 buildings in Cincinnati inspected by our active firemen, and the extra expense has been merely the cost of printing the blanks, and the salaries of one or two clerks keeping records of those reports. It is all done by inspectors—one from each of the 45 companies—every day. They enjoy it and benefit by it. But notwithstanding all this reduction of fire waste and elimination of certain classes of fires, we had in Cincinnati 101 *more fires than in 1911,* and those were extinguished by the work of *more than 1300 hours less by the fire department.*

I want to call your attention to differences in systems of inspection. Cleveland, with more population than Cincinnati, adopted for many years the system of inspection by fire marshals. Each one had a district. The chief told me that was the only way to get results, and cited instances and compared Cleveland's record with that of other cities; and I admit the Cleveland record was good. Yet Cleveland has now eliminated inspections by fire marshals and is having it done by uniformed members of the fire-fighting force.

Mr. Guerin: The remarks of Captain Gasser have brought about almost a development of what we may term an experience meeting, and I hope that, like other "sinners who came to scoff, he will remain to pray." In the first place I will speak for some of the fire prevention experts of the East. They are not taking credit for all the work, but merely as partners, and in the words of an ex-policeman fire marshal when leaving office they can say: "I done the best what I knowed how." As to results, we cannot trust the Almighty for all results, nor accuse him for all the disasters that happen. "God helps those who help themselves," especially in fire prevention. New York City, in my experience, had a *rising rate* of fires until it became almost a custom, a common occurrence each year—right up to 1912. It takes fire prevention work a year before you begin to see results. New York, by this time, sees the results. The same thing in Cincinnati gave us a decreased number of fires with decreased loss and time in fighting them. When I left home the other day we were just 2000 fires behind this time last year. The city of New York had a normal increase in fires of 1000 a year, and suddenly it stops. Although there is an increase of 50,000 people every year in population, yet with the added population the normal increase in fires ceased. Our fire loss so far is $3,000,000 less this year than last year.

Mr. C. B. Whyler (Cleveland): I am deputy chief of the department and it has fallen upon me since the first of January to take charge of the fire prevention work. At the beginning of the year we had four fire wardens to inspect buildings in the inner section. We found our fires and losses increasing every year, so we set on foot the system of inspection by detailing firemen from each company in the city—35 steamer companies and 13 trucks. Each man starts out at 8.30 and comes in at 4. During that time he looks to the outside hazard and exposure as much as inside. He inspects every building from cellar to roof, and makes report of the conditions found. We frequently found an accumulation of rubbish on the roof. That is an outside hazard, and often we have had fires caused by sparks on the roof. We found rubbish on the stairways—and wherever a man throws rubbish in a dark corner that is where another fellow throws a match. We have made 249,000 inspections (including back yards and premises about buildings) during the first nine months of this year; and of 17,000 violations up to the time I came away we had corrected all but 72. It was estimated that 29,000 loads of rubbish were hauled out from the premises of buildings and yards in the city. That sort of clean-up is bound to reduce fire loss and waste.

In addition to the fact that the men are cleaning up the city, I want to say that each and every fireman is gaining knowledge of the construction of the buildings, and knowledge of how to get in and out; and the firemen are a great deal better qualified to fight fire with less danger to themselves as well as more likelihood of saving the property. You all know that if a man has a fire in his own home he can go in on hands and knees and extinguish it with much less danger than if he did not know the construction of the building.

We also devote a great deal of time in Cleveland to looking up the matter of the incendiary. During the first 9 months of this year we have convicted and punished 17 people, sending some to prisons, others to the reformatory. That activity will also reduce the fires in Cleveland.

I believe there was a resolution passed to do away as fast as possible with the outside fire escape. I believe the outside fire escape is one of the best pieces of fire protective apparatus we have. I believe, in my 27 years of service, I could enumerate at least a dozen people that firemen have saved by climbing these escapes and bringing people down.

Mr. E. F. Weisser (York, Pa.): Our inspection is now controlled by our chief, who is paid and has assistants, and he tells me he runs against cases where his authority is not sufficient. There is a lack of sufficient legislation. One particular case in a furniture store illustrates this, where there was a collection of excelsior, paper, etc., that the chief insisted should be removed. The owner or tenant became obstinate and refused. They tried to call in the law and were up against it. There is not enough legislative authority in Pennsylvania.

Mr. Guerin: We met the same thing in New York City. We racked our brains for awhile and I happened to think of an old-time law existing in every State in the Union—the common law on nuisances—which prohibits any man from maintaining on premises to which he invites the public anything hazardous to life. We used this law and obtained a conviction.

Mr. Crawford: I understand both of these resolutions under Topics 9 and 10 are being considered. I want to say a word about each of them—a suggestion that can be made in the form of a resolution. In regard to "an occupancy license based upon competent legal inspection at the charge of the property licensed," I believe that is a question of expediency purely. If you require a license to be issued and not to be charged for it will not be easier to get it enforced. So I suggest that be omitted, leaving to the State or municipality to determine the method whereby the cost of inspection should be paid for. I would put in place of that the words "by the fire-fighting force," so that it will read: "An occupancy license based upon competent legal inspection, at the charge of the property licensed, by the fire-fighting force."

In the first portion of this resolution the words are: "The control of occupancy conditions, through *minimum* requirements imposed by law." I would leave out "minimum" because I don't like the word "minimum." I told some members of the convention a story: When the minimum wage was being considered by the legislature in Pennsylvania somebody asked a manufacturer who paid low wages: "Do you believe in the minimum wage?" The reply was, "Sure I do; I pay it." I believe that instead of the word "minimum" there should be the word "maximum."

Topic 9 is really the question of "zones," which has been up during the entire Convention. It is in the city planning. The question of zoning or districting our cities for all sorts of purposes, for health, etc., is becoming more prevalent throughout the United States, and in Germany it is being more and more systematized. There is one suggestion of the German zoning system which is applicable here that is not made for fire-fighting but for another purpose. It is that the manufacturers shall be confined to districts toward which the prevailing wind blows; that is, in the direction in which smoke is carried out of the city, not toward the city. So, if you put your dangerous occupancies in that region you also prevent the spread of fire across the residential sections. That could perfectly well be incorporated in your propaganda.

With regard to the height of buildings I am glad to note the accent here on the limiting of the height of buildings. In New York there is a committee appointed by Mr. McAnany trying to solve the problem of the height of buildings. The example of New York will not necessarily be a good one to follow in other cities. That city has diseases to be cured not always true of other cities; nevertheless the regulation of the height of buildings comes, in a sense, under occupancy standards, because we shall zone the skyscraper district so that only in the present portions of cities affected by skyscrapers shall they be permitted to erect other skyscrapers; and if you limit them in that you limit the zone occupied by the one form of very dangerous buildings, which is dangerous from the point of view of fire as in many others.

Mr. Barton: In the city of St. Louis the inspection is made by the captain and lieutenant of each fire company, having a blank form showing the construction of the building, occupancy hazards and protection.

The captain or lieutenant making inspection hands the slip referring to electric wires, gas meters, stairs, air shafts, etc., to the occupant, who signs it and then returns it to the chief's headquarters. The St. Louis fire prevention bureau, having 18 inspectors and 1 reporter, also does inspection work. They always inspect electric wiring; and the three lighting companies in St. Louis will not call a building safeguarded unless the occupant has a certificate showing that the wires have been put in according to the National code. There are 4 inspectors without pay. One of the building commissioners put a man on inspection of fire doors and extinguishers and 3 men on the inspection of sprinkler systems, and by constantly so doing keeps down the fire loss in congested districts.

MR. HOLT: We must bear in mind that conflicting interests are represented here, and the thing this Convention must do is to find the common ground. Now in reference to the matter of zones and the German system—some German cities have grown rapidly, and as we expect every city in the United States to grow, the zoning system may be most impractical for us. I may say as a representative of a chamber of commerce that you must consider the commercial interest, and while we may all agree on the principle and purpose we should consider that the method must be worked out with regard to the interests and nature of the community and its possible development.

I presume that when the Baldwin Locomotive Works was located here the present site was still out of the city; but the city has grown around it. If you try to regulate too closely that problem in a growing country like the United States or Canada you will meet with opposition. The only reason we ask for this sort of thing is because you and I alongside of the man with a high rate of hazard are endangered. The great mass of people are interested rather than one man. As it is a collective benefit the cost ought to be collectively borne.

MR. DOYLE: I have, as have all in the Convention, been very much impressed with the proceedings the entire week, but it has occurred to me that a great deal of time, and perhaps rightly so, has been spent in dealing with the solution of problems in the greatly populated centers. We have problems out in the West (as has been touched on by Mr. Blunt, of Maine) with reference to the small community, smaller cities and villages; and perhaps it might be well to remember in this Convention that we have drifted many hundred miles from the center of population in this country when we assemble in this beautiful city of Philadelphia. Conditions that must be met in these great centers of population are such that they should engage the best thought of this Convention: and yet, as a practical problem, we find that the same application, the same laws, the same scale of licenses and fees very often will not apply in the small city and smaller village where they have volunteer fire departments, many without a single salaried man—some chief executive of the municipality serving the city as a matter of patriotism, perhaps without any compensation, and the council as well. Those smaller towns and cities are susceptible to property laws and sometimes to laws of life as well, and how to reach that community should be given some thought, it seems to me, by this Convention.

We have endeavored to apply a plan in Illinois that has had much to do with arousing public sentiment along the line of fire prevention work. After all, as suggested this morning by some speaker, we have many laws and ordinances that are now almost obsolete on our statute books, and the reason they are absolutely dead letters is because public sentiment does not enforce them. I know of a small community in our State that passed an ordinance known as the "curfew" ordinance. It provided that the ringing of the fire bell at 9 o'clock in the evening was a signal that all boys and girls under 16 years of age should be off the streets and in their homes. No one took the ordinance seriously with respect to the penalty imposed if they violated it, and yet it was so wholesome, it was such a splendid regulation that that "curfew" bell still continues to ring in that community, and every child under that age takes it as a signal and warning for it to start for home. Public sentiment is behind it; the father and mother are behind it; and so it is as strong as any ordinance within the covers of a book.

In Illinois, when we adopted the State fire marshal law we incorporated into the statute a provision looking to the appointment of inspectors without compensation. And as a result of that about 150 men interested in the work of fire prevention were given commissions by the State fire marshal, and once each month these men inspected one of the smaller cities of our State. We coöperated with the mayor and the city council of the city to be inspected. We saw to it that publication was made, that the mayor issued his proclamation, and all of the day was filled by dividing these men into squads of inspectors. In the small community that couldn't pay for inspection; and in the business district, the schoolhouses and places where fire was most likely to occur, we gave thorough inspection. At night the mayor of the city presided and the citizenship were not only invited but urged to attend a meeting, and that meeting was addressed by someone versed in the matter of fire prevention. The result of it was that in that community not only every business house was visited through the day and report of the inspections made turned over to the fire chief the following day, with an order to remedy the conditions, but by reason of that inspection and visit these men attended the meeting at night. I have had many men say after those meetings that they supposed we were going to discuss some highly technical question of insurance in which they were not interested; but they came as citizens because we called the meeting there to extend the courtesies of the city, and before the meeting had concluded discovered that they themselves were interested parties; discovered that they were the ones who were paying these enormous bills; that this tremendous fire loss puts burdens on them; discovered that they, by the payment of their premium, were bearing the penalty of this great national sin of fire waste. And those men discovered that not the insurance companies but they themselves should be the ones interested in the reduction of the fire waste to the lowest possible minimum. As a result of this scheme of meetings and inspections in the smaller cities and towns a public sentiment was aroused and the fire limit ordinances and building construction ordinances (we hadn't the means of enforcement that can be used in the splendid city of New York or this good city of Philadelphia) became workable, living actualities because behind them was public sentiment in that community, not only a matter of civic pride but a matter of economy to every individual property owner in that city.

I recall one experience we had in one of our southern Illinois cities. The mayor of that city, of four or five thousand inhabitants, happened to be one of the grocers of the town. When these men made their round of inspection that day he thought he had put his house in order. He had, on the first floor; but when our men went into the basement they found among the broken boxes and empty barrels that had contained crockery—amidst the straw and excelsior they discovered a box which contained 400 pounds of dynamite—enough to have blown that patriotic mayor and his building and the city into eternity. Not a single light was in that basement. The farmer who happened to come into the store and ask for a box, on a busy Saturday, was told to go into the basement; and, lighting his way, with the sparks from his match liable to fall among that débris of straw and excelsior—you know what might have happened! When his attention was called to that basement the force of that dangerous hazard was not impressed on him; but that night, in the meeting, when he presided, there was called to the attention of the mass meeting an ordinance, long a dead letter on its books, and this case was cited to him. He became from that minute and has since continued one of the most patriotic men looking to the suppression of this tremendous fire waste in that community.

I believe, after all, that scheme which can reach the public, that which can arouse public sentiment, that which can bring home to the door of every man and show that it affects him and his family, is the strongest argument in the small community for the enforcement of these laws. And we have found that public sentiment did not alone stop with the small community, but it reached through that small community to its representative in the legislature, as a member of the House or member of the Senate; and, as a result, when the State law needs strengthening we have not only the friendship but the active, earnest coöperation of all the members as well. I believe in meetings of this sort. I am always impressed with the thought that perhaps all the men gathered here, all of us, will go home helped by the experiences given on the floor of this Convention. It seems to me that although we cannot reach the entire public through a meeting of this sort, the State fire marshals can afford throughout the year to take the smaller village and city and bring about a feeling on the part of the general public that not only will bring a better understanding of this great problem but will enlist them with us in this, the greatest work of conservation in this country.

Mr. J. J. Johnson (Deputy Fire Marshal, New York State): Our law was enacted two years ago. We have State-wide jurisdiction outside of cities of over 100,000 inhabitants. We believe Chief Guerin can take care of New York City, therefore we don't go into its area. Our force is organized for fire protection and prevention with the aid of the fire chiefs, and where there are no chiefs, the mayors of towns and villages; and in addition the town clerks are regularly constituted State assistant fire marshals. We find that though we get a reasonable amount of help from mayors and clerks, we get the best inspection from our trained corps connected with the office. We have 19 inspectors who have covered nearly the entire State. We hold meetings for the instruction of fire chiefs and send literature to them with instructions for inspections.

By a recent enactment it becomes obligatory upon all locally constituted fire marshals to perform duties as such; and they are liable to fine or imprisonment or both if they fail to perform their duties. We have been given supervision over the inadequacy of the water supply in the different towns and cities, and over the fire equipment and apparatus; and we may make recommendations for their betterment.

We find in a great many villages that the water pressure is much below the normal and the fire equipment obsolete in many cases. Another provision of the law gives us power to enforce our recommendations. We have not as yet taken that power upon ourselves but it is only a matter of time when we expect to have to do so. Along the lines of fire prevention and licensing, it seems to me that a fire prevention bureau in a city should have that power within itself, inasmuch as their inspectors are regularly going through these buildings. The data is recorded in the books of the bureau, and it would seem to me that an additional license would be unnecessary. As our friend from Newark has stated, property owners are already taxed almost to the limit. Our fire marshal's department has had good success, but it was a question as to whether we would be received well, when called upon, as is frequently the case, to get an owner to spend several thousand dollars additional on his building.

We find the Legislature is with us in our work, and the people are taking kindly to fire prevention measures.

MR. E. P. HEATON (Canada): I think that a voice from the Frigid North has not been heard, and at the risk of intrusion—

MR. EVANS: No, indeed; you are a representative here. We want to hear from Canada.

MR. HEATON: I want to say two or three things that have been on my mind which do not perhaps fit in altogether on Topics 9 and 10; but as you have allowed a fair latitude in the discussion, perhaps you will permit me to wander for one or two moments. I find it hard to follow a distinguished and forcible speaker like Mr. Doyle. I represent a group of Canadian manufacturers who, in an association of two or three thousand men, practically represent the entire manufacturing interests of Canada. I am here because the Canadian Manufacturers' Association is represented in the National Fire Protection Association. My own department is known as the insurance department.

Now, having made that quite clear, there are some problems that are yours and ours. There are some in which we are not interested. I felt yesterday, when there was a discussion as to whether $25,000 or $350,000 should be asked as an appropriation from Congress, I would vote for $1,350,000, because I don't have to pay it. But in connection with Topics 9 and 10 we do have a community of interest, and what you decide here must of necessity be a sort of inspiration to us in our own country. But what are you going to do with a man who deliberately goes contrary to or avoids municipal ordinances?

We have heard from Mr. Guerin of an old law on the statute books resurrected for a good and sufficient purpose. I presume we all find our small municipalities hard to take care of. We all have statutes on our books more honored in the breach than in the observance. What are you going to do with the man who doesn't observe the law on the storage of inflammables?

I have no brief for the insurance companies, although I was for thirty years in the insurance business. Suppose such a thing had happened as an explosion which would have wrecked that store mentioned by Mr. Doyle and possibly destroyed that town! The insurance companies within 24 hours would have had representatives on the ground with draft forms and check books, and would have scrambled over one another to try to be the first to pay that loss and get the greatest credit for it. Perhaps I am right that in this country there is a growing departure from that practice, but, unfortunately, with us in Canada it is not so. The insurance companies are philanthropic. They make every effort after a fire to rush in and, like acceptable angels, leave a deposit in the form of a check, often without proper investigation. Of course, competition has had something to do with it. We desire in our country that the insurance company should have the name for liberality; that we should appease our agents and give the impression we want to pay losses on properties. We give the impression that insurance companies are too prompt in the settlement of their losses.

This year I happened to be over in Germany and, having a few hours at my disposal, thought I would try to get at the secret of a statement made to me in this country with which we are all fully familiar—"Why is the record in Germany and Great Britain in respect to the loss ratio so much less than on this continent?" But I found that the few hours I had were absolutely inadequate to enable me to form anything but the most superficial conclusion, and I arranged with a gentleman in Berlin who, I may say, has some direct relation with some United States work over there, that he should in the succeeding three or four months prepare a report for our Canadian Manufacturers' Association on "Fire Prevention" that would show us how and why these internal conditions exist in Germany so we could take the benefit of it. I outlined to him a syllabus of the class of report I wanted him to make. Just before coming to this congress I received the first two chapters and am sorry the third is not ready, as I might have afforded you a statement from the most authoritative source that would have gone into your Record. I hope to present it to the National Fire Protection Association if it doesn't reach the Record of this congress.

MR. EVANS: If you will send it to us it will be put in. (See Appendix 7, page 449).

MR. HEATON: I shall, if I receive it in time. I want to tell the things I asked of my friend in Berlin: "Have you any regulation in respect to a penalty for the violation of a municipal ordinance or of a misconception or misconstruction under the building code?" He said: "I will make that part of my report to you, but I think I can safely say to you that we do have. After a fire has occurred the fire department officials promptly take charge of the building or débris and personally proceed to make an investigation. If it is found that the fire is due to culpable carelessness or willful violation of municipal ordinances or building codes, then it is either law or understanding (which I will tell you in the report) that the insurance companies must not pay that man his loss for that particular house."

That set me thinking. Is it not perhaps well for us in Canada (I will leave you out) to immediately derive some profit, and protect the insurance companies against themselves, not necessarily from the payment of their own funds but the payment of the ***trust funds in their hands,*** the payment of a loss for deliberate violation of municipal ordinances or building codes?

We are all talking in a discursive way; and we are all keenly interested in the various means of reaching the end we all so much desire. I am free to confess to you that we in Canada have had too much to do in the last few years with the problems arising from development and growth to think of the enormity of our fire waste; but during the past two or three years we of the Manufacturers' Association have realized it is our fundamental duty to educate the people of Canada on this point and are spending some money to accomplish this end. We are all interested in how it may be accomplished. If we can in any way contribute to the lessening of this tremendous evil of fire waste we are doing something for our time and generation. And, in connection with Topics 9 and 10, if you can incorporate a municipal ordinance that would also protect the insurance companies against themselves we may do something particularly useful.

MR. A. LINDBACK (Winnipeg, Canada): In Manitoba, when a fire takes place that is of doubtful origin, I have, as fire marshal, held that insurance company's payment until investigation has taken place, and in one or two places have been able to get evidence enough to withhold that payment entirely. In many more cases, however, the payment has simply been held up until more details of that fire have been procured.

MR. EVANS: If permitted I will refer briefly to several points that have been raised here. With respect to the attendance at this Convention, it is not our fault if people do not know about the proposal to hold it and have not come, for 3500 initial invitations were sent out by the 31st of last May; and we picked out every conceivable list we could find, especially of those in official positions. There has been continued correspondence about all this work during the summer. About three weeks ago 4000 formal engraved invitations were mailed with full details of this Convention. Of course it is a serious sacrifice of time and actual money to come here and spend a week; but if the towns have not been represented it is because of their inability to do so; and because of their inability to care for this problem at home we need the State to take hold.

There has been only one discordant note in the replies to these invitations—a rather curious point. Included among the invited conferees were all the labor organizations; and certainly the labor element suffers from fire hazard as much as anybody. In many of these cases our invitations were returned with the comment that no reply would be made because the printing did not bear the "union label."

In answer to other comments on these topics, after something like four or five years' study of this work in different countries in Europe, I am convinced that so far as keeping to the excellent but drastic police control that is obvious, particularly in the German empire, we have no venue of relief in this country. Our people do not want to be governed n that way and they will not; and without such police control it is hardly ossible to effectively make zones and locate manufacturers where they uitably belong for even excellent reasons. We must have some more lastic method because in this country we will not stand for too much olice. Some reasonable method of legal regulation does not make for nore law (perhaps for less law) but for better law. In this city we found hundred different laws on the subject. The first thing that any individual, or group of individuals, or any governmental official needs to do n starting to better the fire control in any community is to call in a good awyer and digest the laws and see what can be dispensed with; then roper laws to cover the needs of the case should be drawn and enacted.

With respect to the enforcement of these laws there ought to be olunteers to help in a public-spirited community and create interest in he work. The proper agencies are the trade associations of this country; ut most of them have been asleep in this matter, and are too ignorant o know it. I am in enough of them to know, and have frankly told hese what I tell you to-day. Recently Mr. Taft started a strong movenent to weld together in some form the chambers of commerce and oards of trade in the United States. Mr. Wheeler, an able banker of hicago, has drawn over 400 of these into a group, with the central ffice in Washington. He finally named a fire waste committee and asked ne to act as its chairman. Mr. Holt is one of that committee from hicago. These organized commercial bodies in various centers can help remendously to create public opinion for enforced law to control fire aste.

I do not agree with the thought that because the temperature is ower in winter and there are more fires in the chimneys—where they elong—that they should extend to the property. I believe we should nake people build property and repair and clean up the flues so as not o fire property. I do not believe the influence of organized inspection is ransient. The mutual insurance companies have not found their inspections ineffectual during the past thirty years. In the entire group of roperty so insured in and around this city the loss ratio used to run bout fifteen cents per hundred dollars; but a few years ago they put a entral inspection bureau here and by means of these inspection processes the losses have been cut down to about five cents per hundred dollars.

With respect to this matter of taxation: Nobody likes to be taxed. I never knew a man who did. But to make a man spend a dollar to save ten dollars is not taxing him, it is forcing him to be economical; and if you make a man spend a dollar in a dozen different places and save him a hundred dollars the result is certainly beneficent.

Commercial inspection totals up a bill which cannot be raised by general taxation. Everything new is usually pared off from the final budget and the great sum of $400,000 (which it would cost here) cannot be raised in this manner. If you put the cost where it belongs, an average of $1 per house, you would immediately get from this new source the money necessary. There is no reason why each man should not pay his share. I believe the individual ought to pay for the occupancy license if it is reasonable and necessary, and I believe it is the only practical way to raise the money. If this city is burning up $3,000,000 a year, and experience shows this waste can be cut to less than $1,500,000, I would prefer to see this saving effected although it should cost $400,000 to do it, especially as the inspections would be so useful in improving housing and sanitation conditions as well.

With respect to State legislation, during the three years we have tried to work out some politically practicable scheme here which the legislature of this State could adopt for a building code, we have found that the principle of home rule is very strong; and the only limit that seems to be reasonably imposed on the adoption of the theory of home rule in State laws is that of practical workability. A State law on fire prevention or sanitation or health should permit home rule wherever there is any local agency *continuous* and *efficient* enough to administer the law. The basic law should simply deal with a safe minimum of what should be used by everybody anyhow, but should permit local communities to vote on and adopt increases in the requirements if the local feeling and sentiment favor that course. In the absence of local capacity to govern these abuses automatically the central State official concerned should take local control.

We have roamed a little here to-day; but as this is the last topic that really embraces the *physical* side of this subject, except perhaps the questions that will come up under "Management" to-morrow, I will call attention to what the fire marshal of New York State brought up—the control of water supplies. This movement of fire prevention runs parallel with the whole movement for social betterment, morality and sanitation—good health in every view of the science. They all travel the same road. Recently there has come up a conflict between the health authorities and the control of fire in this city, and it is spreading al over the country. It is this: Philadelphia now has an increasing rate of typhoid fever. Typhoid fever in the aggregate comes principally from an adulterated water supply. A mill equipped with any system for distributing water for fire protection needs for certain action a double water supply. Many factories along the Delaware and Schuylkill rivers use ık for one source of supply, and also have a reserve connection to the which introduces raw unfiltered water through the fire pump when ed. These connections are all controlled with appropriate check and rol valves; but as these valves, to be absolutely tight and prevent the ıge of minute quantities of water, need almost constant cleaning, h is not practically possible, it is charged that this raw water filters the system of water mains which distributes the potable supply and by produces in this community an increase in this disease.

These conflicting needs create the imperative demand that the groups ureaus governing us in toto in our various communities find out e they can come together and where they must differ, and discover ssible some efficient means of compromise. In this case it seems to in an increase of special controlling valves to stop the leakage of water into filtered water mains, and yet permit practical duplication ıe fire protection water supply.

MR. H. M. WILSON (Bureau of Mines): One of your remarks, Chairman, concerning the statement of the gentleman from Canada, t the compulsory police regulation in German cities of fires and their n, as compared in your judgment with the response of the American ıch compulsory regulation, finds confirmation in the fact that the ed States Bureau of Mines has had an almost identical experience regard to directing attention and effort of the mining industry to ıazards, not only with regard to fires, which is one of the greatest rds in mining, but also to sanitary conditions, etc. We find in nany and England that there is a certain amount of extensive police lation; whereas, though we have State inspectors and a series of lations and laws in this country covering means to assure safety, the ram in the way of penalization is not and cannot be carried out in country as abroad because of the character of the people. The eral bureau, having no police power, has found it practicable, neverss, to make considerable progress in the past few years, as shown by istics of loss in mines. This loss has been markedly reduced within last five years through educational methods brought to the attention he mining industry, both the operator and the miner; and as a result that form of governmental energy there has been and is a large ortunity for the reduction of all kinds of unsafe practices. I conntly believe as a result of this experience that you will not make material progress by enacting legislation or making drastic regula- to enforce such requirements that you can and will make if you can elop some system of education on the subject. Perhaps that end can t be accomplished, as stated in the paper yesterday, through the ntion which a Federal bureau can attract and its coöperation with nicipal associations and boards of trade. I suggest the advisability of considering that your most likely method of reducing the fire hazard consists in education rather than in the enactment and enforcement of laws.

MR. CRAWFORD: With regard to the suggestion that has been made about German States and European cities in comparison with the United States, it is a popular theory but a fallacious one that America does not follow European cities. I was interested in the *Telegraph,* of London, which quoted Mr. J. Pierpont Morgan, who said he studied the phenomena of Germany and Europe generally because it was what would occur in America in ten or fifteen years. It is true that the measures introduced in Germany for the last ten or fifteen years have been tried here. I am sure that in the course of a few years we will do what they have done in Germany. You might as well take the good things and cut the bad things out. There are too many Americans going over there not to bring that about.

There is another popular fallacy. We think our American cities are growing rapidly. The chief of the Board of Engineers in New York City compared six of our cities with six European cities since thirty years ago; and while he showed how the American city had increased in population in that time, the German cities with the same initial population had increased 202 per cent.—half again as rapidly as American cities—so that the popular theory about our enormous growth of cities, as compared with European cities does not stand the test of statistics.

MR. EVANS: There is one thing about education in regard to the improvement of old property, and that is about the cost. The fact that property has been allowed to stand as it has to date is no reason why it should not be improved. The law has frequently decided that if a property can be shown to be a danger to the community and can be reasonably corrected and improved at a cost which will yield, say a 20 per cent. investment, through the saving effected by lower insurance rates, there is no reason why the improvement should not be enforced, the community danger reduced and the lower rate for protection demanded and made effective. I would suggest that as we have now discussed these resolutions together we incorporate resolution 10 as (c) of 9, and put (b) of 9 first, because it happens to be the community consideration. (Reads revised sections A, B, and C, omitting in section A "a minimum requirement, city planning" as suggested by Mr. Crawford.)

PROF. WOOLSON: I would like to have information as to whether the application of the last few words, "by the fire-fighting force," would be in conflict at all with the organization of the fire marshal's department doing the same kind of work? If so, I would suggest adding "or an adequate similar agency." Or, does the sentence "based upon competent legal inspection" cover it?

Mr. Evans: No; one defines the course and the other the agency which that course is to be carried into effect. The purpose of the ussion is to emphasize the fact that these thousands of paid firemen the force to be preferably used in this work, and we should refer to n as the first available means to be employed, if possible.

Mr. Crawford proposed the revised resolution by motion, which fessor Woolson and Mr. Guerin seconded. On vote this motion was nimously carried.

On motion adjourned.

Resolution Adopted on Topics 9 and 10

"It is the sense of this Convention that:

(a) The individual occupancy hazard (the relative fire hazard to life and property in any given building inherent in any given pursuit) should be definitely controlled as to construction by the building code; and as to management by proper police (or equivalent) continuous regulation to assure reasonable safety of life and property therein;

(b) The general occupancy hazard (the relative community hazard inherent in any given pursuit) should be definitely controlled in every populous community by law, which should exclude extra hazardous pursuits, and properly place and safeguard by appropriate legal rules permissible hazardous pursuits in their appropriate danger zone (or other like delimited area); and

(c) The control of occupancy conditions, through requirements imposed by law, is essential for the abatement of fire waste of life and property; and this control to be actual and effective should cover all property (at least in cities) and continuously—at least once annually—and upon every substantial change of tenancy, through the agency of an occupancy license based upon competent legal inspection by the fire-fighting force or an adequate similar agency."

lines, trails, roads, fire lines, patrolmen's cabins, tool boxes, and
mprovements designed primarily for fire protection. Lookout sta-
ermit quick discoveries of fires; telephone lines prompt notification
r occurrence and the advantageous handling of fire-fighters; trails
ads give rapid transportation of fire-fighters and supplies; and fire-

A Massachusetts Forest Fire Lookout Station

ore effective control of fires. Funds invested for improvements
eap insurance against great financial loss.

principal causes of fires are railroads, lightning, campers, brush
and incendiarism. All forest fires except those set by lightning
entable. Education of the public in fire prevention is, therefore,
tant as patrol; and should include such measures as the widest
publicity in the press, proper instruction in the schools, appeals
speakers, wide and continued distribution of literature, and the

enactment and the enforcement of punitive laws for the destruction of forest property through carelessness in letting fires escape or willfulness in setting them.

Common measures for removing causes and reducing fire hazard are: The use by railroads of oil for fuel, of spark-arresters, or of electricity as a motive power; the clearing of railroad rights-of-way through forest land, supplemented by the construction of fire lines adjoining the rights-of-way; the patrol of rights-of-way during dry periods, particularly after trains; the posting of fire warning notices; storing of fire-fighting tools at vantage points; notification by trainmen or by interested citizens to forest officers of fires; the extinguishment of campfires before leaving them; the suspension of the open hunting season during dangerously dry periods, and adequate assistance in the fighting of fires. Wherever slash or débris left after lumbering will endanger the forest it should be disposed of. This is done on all National forests, by a number of States, and by some private owners. The burning of brush by settlers or farmers in forest regions should be done only during a closed fire season, and on permit from a fire warden.

The protective system must have adequate funds, depending on the fire hazard or the degree to which the forest is subject to danger, the fire liability or the damage which may result, and the area of forest lands to be protected. The funds available for the administration of the National forests, including fire protection, are about two cents an acre. States should be able to provide effective protection at an expenditure of not to exceed one cent an acre, if the larger private owners, the railroads, and other corporations will assist in the protection of their property. No States at the present time appropriate funds sufficient for such an expenditure.

The coöperation of all protective agencies should be encouraged as far as possible. The Federal Government is in many cases operating under an agreement with States and private owners for the joint protection of their holdings. In addition, it has recognized its duty to aid the States in protecting the watersheds of navigable streams. States have made provision for expending funds jointly with other protective agencies. State aid encourages private effort; Federal aid encourages both. In the light of experience, it can safely be said that the best results in fire protection have been secured where the various protective agencies—Federal, State, and private—have contributed jointly and work together in confidence and in harmony.

MR. RANE: It is a pleasure to be present at this Convention. I will say frankly that when Governor Foss asked me to come on here as a delegate from Massachusetts I felt in my heart I was going off on a sort of junket. I hadn't met any of your men and I felt you were interested more in house fires and city fires; that you had a powerful organization and so many other important things before you that the idea of forest fires might appear insignificant. I thought so before I attended the meeting; but I have been here during your sessions and the discussions have been of interest and profit to me. Your organization appeals to me, as you can broaden out; and your idea is to be here for some definite purpose—that is the thing impressed upon me.

The question of forest fires is only a little broader and wider than the proposition you are already working out. When I became State Forester of Massachusetts seven years ago I went into that State with the idea of doing something for forestry, and Massachusetts is not a very large State. First, I was only given a desk in the sub-basement of the State House, and a stenographer. The thing was in the air and Massachusetts likes to be one of the leaders in things, and so I was called into the State. A man never knows until responsibility is thrust upon him—as Mr. Evans must know. I went into Massachusetts, and the first thing to do was to take up the most important phase of the subject—forest fires. I took a train and went through the State. I sat on the observation end of the car and took notes. I was not very long learning that the great problem to solve, before you could do anything in forestry, was this question of forest fires. I found them running rampant over that great State. We could do nothing until we had some broad public policies. I talked with a number of legislators, etc., and told them we had to have some laws. They said there were so many now we only need to bring them to life. When a fire broke out in the Northern Cape country and it would appear in the papers I next day took a train and went to look at it. We have three selectmen as fire wardens each year. They would appoint a posse of fire wardens. There was no compensation. Nobody knew who they were, but thought it was a sort of compliment. When a fire broke out everybody went out to the fire, and we got 150 summer boarders. We were filled up with these in the summer; but the fire usually would go out of itself. Everybody would grab a mop and broom to combat the fire, but it was generally too hot to get near it when they gathered. The fire went out of itself. Even our fishermen would have to be paid 25 to 50 cents an hour. It was a "run-out-at-the-bunghole" policy. I started out by getting some laws, and we have secured two or three or four every year. To get system out of chaos it was necessary to work night and day. I found we had chiefs of fire departments in our small towns equipped with brass buttons, etc., but how many helping us? In one case we had a magnificent forest on fire. We sent into the city to bring some equipment, to bring out the fire department. The chief of the fire department told my messenger to go somewhere, saying, "We are not going out into any woods fire." In that particular instance there were more values being burned up than if the whole town was burnt up itself. Here was a man not big enough to assist. We all recognize that the insurance companies and you men represent here a much larger standard of wealth than we men in these little country districts. I have been at our boards of trade trying to get something done.

I have invited them to come to our firemen's association in the State; and in Nantucket, for instance, there were many chiefs—a fine lot of men. I said: "I want it understood I have a prejudice against the average fire department chief."

We have changed our laws now so that in every town we have a forest warden and with some equipment. When I first had forest wardens it was hard to get them to act. At first they were without pay; it was hard to get someone of the three called fathers of the town to act as forest wardens. It was also difficult to arrest anyone in the town when you knew he started the fire. We have changed the law so that we have one forest warden in every town. When we get a man in who is any good we hold him in, and when they want to put a new man in as forest warden, if the holder is a good man, we require that they give reasons for having a new man.

We have a class of people moving out every day to the cheap tenements—the foreign element. Now if, as things are going, we get some equipment in the town, this equipment for forest fires is very good for house fires. All I ask for is a strong wagon and half a dozen extinguishers, eight or ten, and some rakes and shovels. Then I have placed the responsibility on one man, who is responsible to the State forester and to the town. I have the State divided into four divisions; for instance, west of the Connecticut River I have given him all that section. Now we have started out by the State giving 50 per cent. of expenditures, not to exceed $500; and the small towns are taking advantage of that. Some of them are getting trucks. We have 22 lookout stations in Massachusetts on our high hills, where we have telephone connection with all the towns, and in that way, if a fire breaks out, they know it immediately.

This question of forest-fire prevention goes right in with the city and town. In Illinois there are 3,000,000 acres of land with nothing but forests. I tramped all through the Black Forest of Germany last year, and I concluded we should have an annual income of from fifteen to thirty millions of dollars from these lands of ours to-day. The State association should broaden out so as to take our forests in. I am going to ask the legislature this year for a small "slash" law, so that the slash will not get on fire around railroads, etc. People say, "Oh, well, the land isn't any good!" But it is one of the fundamentals. I think you could well afford to bring in a lot of forestmen to meet with you men. The railroad fire question is part of it—as to the burning of oil in engines, etc. I will not attempt further details, but merely ask you to keep up interest in forest-fire prevention.

"Sundry Fire Hazards"—Continued

FIRE HAZARD IN RAILROAD TRAVEL

MR. EVANS: There is no reason why any sound program on this conservation question—that is what it is, whether of natural or created resources—should not have in its propaganda the caring for the fire hazard no matter where or how it finds expression.

The next broad subject of fire hazard (and it is not as broad as you might think) is that of Transportation on Railways. I will read the following letters and papers here on this subject. I wrote the Interstate Commerce Commission and they answered as follows:

INTERSTATE COMMERCE COMMISSION

MR. POWELL EVANS WASHINGTON, September 30, 1913
Chairman Fire Prevention Commission
Room 420, City Hall, Philadelphia, Pa.

DEAR SIR:

Yours of the 27th, inviting this Commission to send a letter defining he reasonable requirements that we think might be imposed upon railways to control fire danger, to be used in connection with your Conven-ion on the afternoon of October 16th, has been referred to me.

This Commission is charged with the administration of certain acts f Congress requiring the use of devices or appliances calculated to promote safety in operation, and at times we are requested by the Congress to pursue investigations along similar lines.

For these reasons, it does not seem proper for us to express any opinion as to the requirements that should be imposed upon railways to ontrol fire danger. ***We have made no investigation of the subject and re therefore not in a position to speak intelligently thereon.*** Unintelligent suggestions or discussions are apt to be worse than none at all.

It goes without saying that every reasonable protection should be made against danger by fire and that the members of the Commission re in accord with the general effort in that direction. We do not feel ufficiently well acquainted with the details of the subject to justify giving xpression of any concrete views.

Your cordial invitation to attend the Convention is appreciated, but previously-made engagements demanding the presence of the members f the Commission make that impossible.

Yours truly,

E. E. CLARK
Chairman

We were more fortunate in getting a very clear expression f opinion from undoubtedly the highest authority of the country on this subject, the Pennsylvania Railroad. The Pennsylvania Railroad has at present over 50 per cent. of its passenger equipment all steel. This approximates the amount of all the other steel equipment in the country; and I am informed they have built no wooden cars since 1906, when Mr. A. J. Cassatt, then president of the company, adopted this principle when he announced: "No wooden cars shall be built to go out of New York City." The following letter by Mr. Gibbs gives a very authoritative opinion and quite a new one:

THE PENNSYLVANIA RAILROAD COMPANY
GENERAL OFFICE, BROAD STREET STATION

PHILADELPHIA, October 16, 1913

MR. POWELL EVANS
Chairman Philadelphia Fire Prevention Commission

MY DEAR SIR: In response to your invitation that I give you "the controlling principles and practice that should be applied in the protection and management of safe cars, with respect to fire hazard, for railway transportation of passengers," I beg to submit the following outline on the subject, as I see it:

In the substitution of some other passenger car in place of the existing wooden car the conditions to be met are:

First—That it shall be stronger than the wooden car.
Second—That it shall be fireproof.
Third—That it shall be habitable.
Fourth—That it shall be, if possible, lighter.

The question of cost was necessarily waived during the development period.

From the fire hazard standard we must consider all types of cars, from the absolutely fireproof construction to that in which the principal hazards of the existing equipment are eliminated.

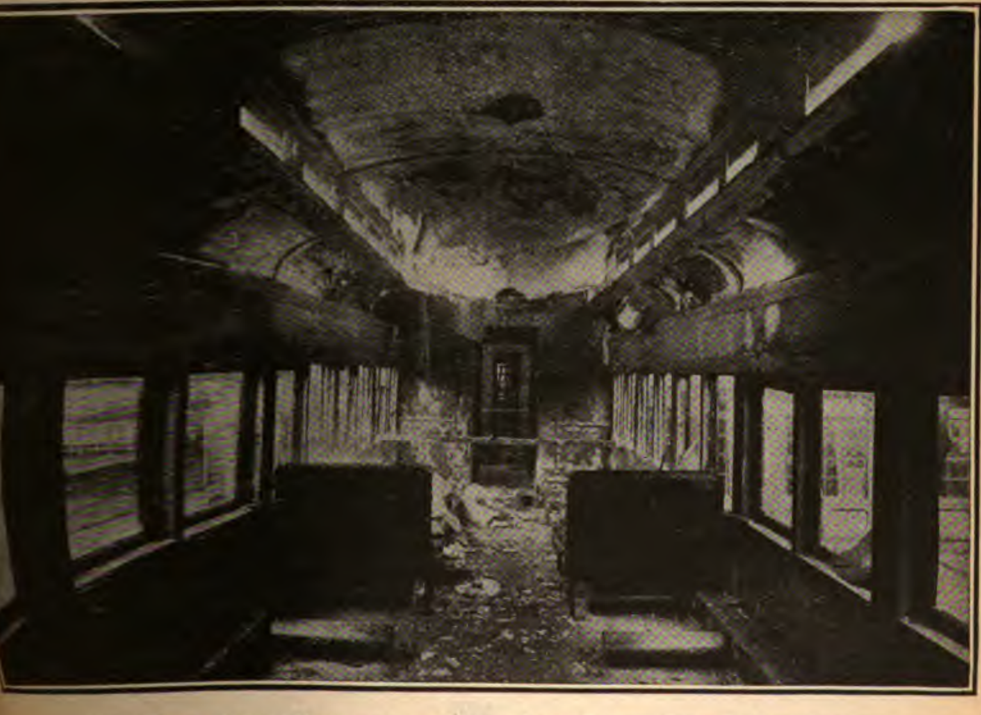
My opinion would be that a car which in its construction does not incorporate sufficient inflammable material to transmit flame from one part of the car to another part may be considered as meeting all of the conditions from this standpoint.

The sources of the fire, in the order of their frequency, probably would be (1) coals scattered from the locomotive; (2) fires originating in the lighting apparatus; (3) extraneous fires in surrounding wreckage; and last, fires originating in combustible contents of some of the cars in the train, such as mail and baggage cars, etc.

Taking the passenger-carrying car, for example, the extreme case would be one in which the exterior body, the interior lining, the window frames, seats, and the heat insulation would all be of metal or incombustible material.

In this case we immediately face the question of habitability. Assuming that a comfortable temperature of the car is 70 degrees, it may be assumed also that the interior surface fairly approximates this figure, which is 28 degrees below the temperature of the human body. If the surface against which the body rests is a good heat conductor and transmitter, the body will be chilled, and it speedily developed that the parts of the car with which the passenger must come in contact would be very uncomfortable if of steel or other material having similar heat-conducting properties. Manifestly, also, the seats, cushions, etc., cannot well be of any material other than textiles. The principal points of contact are the arms of the seats, the sills of the windows, and the sash. The glass in the windows may be enclosed in either wooden or metal frames. There

This Test Car Was Burned Four Times to Test Four Schemes of Finish



The Fire Acted Vertically. Plush Seat Backs Shown Not Singed. Metal Finish Alone Endured are no mechanical difficulties in the use of either of these materials, but the metal sash and the metal sill have proved so objectionable that it has been necessary to use a substitute. Considering all the materials which present themselves for use, and giving due weight to the non heat-transmitting characteristics of each, to the ease of workmanship, and to the strength when fashioned, wood is preëminently the best available material.

The question then arises, is the amount of wood necessary for this purpose a menace from the fire standpoint?

This question was pretty definitely settled in some rather extensive tests made at Altoona about five years ago, in which one of our new steel passenger cars was submitted to test.

In the original equipment of the car the headlining, window sash, seats, and some other minor parts, were of inflammable material, in addition to which the paint and varnish should not be forgotten. The combustibles placed in the car consisted of finely divided wood and shavings, with about ten gallons of benzine. The fire resulting was very much more severe and rapid than any which would be liable to occur in case of an accident, the idea being to learn the worst that could happen. In this case the fire traveled through the length of the car, and there was some question whether it would not have traveled through more than one car. After each test the interior of the car was reconstructed, finally reaching a point where the wood was confined to the sash and the seat frames, the cushions being of the usual construction. With these conditions, it developed that the effect of a fierce fire applied from the interior was purely local. It developed that one sash would not communicate fire to the adjoining one; that the same held true of the seats; that the paint and varnish would not carry flame because the heat-absorbing qualities of the metal lining reduced the temperature below the ignition point. It is fair to say that such a condition could hardly happen in actual service. The fires which destroy cars have, as a rule, very small beginnings—usually from coals from the locomotive coming in contact with splintered wood; and in other instances these conditions have been aggragated by ruptured gas tanks.

It is probable that even were a considerable amount of wood used in the interior of a steel car, fire would be of extreme rarity because of the steel outer shell preventing contact with live coals scattered on the track.

While the bedding in sleeping cars is, of course, very combustible, and must be so, the chances of rapid communication of fire are very remote, particularly in view of the electric lighting which is so generally used in the modern steel equipment. In daytime wrecks, when the berths are closed, the fire danger in sleeping cars should be practically negligible; and even at night, the danger would rather be from extraneous causes.

In the cars carrying large quantities of inflammables, such as postal, baggage, and express cars, the danger is from the contents rather than from the cars; but even this involves contact with extraneous flame from burning wreckage, etc., and I believe would be confined to the car in which the fire originated. Considering the fact that the substitution of steel freight cars for wooden ones is progressing very rapidly, it is evident that the time will come when such extraneous fires will also be a thing of the past.

It must not be forgotten that fire, even with wooden equipment, is 1 unusual accompaniment of train wrecks, and it is very much a ques- on whether on roads having light and infrequent traffic much added fety would result from the substitution of the steel or fireproof car, hile the question of the expense of the substitution would undoubtedly ean bankruptcy to many of the smaller roads which are now barely le to exist.

In this connection it may be said that the question of the insulation f the steel car against heat and cold presents considerable difficulty, and at experience so far shows that the demands on the heating system are early double those from the wooden equipment. The question of the st material for insulation is still an open one, with wide differences of inion among those best qualified to judge.

Summing up, I would state that the substitution of steel passenger uipment cars for wooden ones is progressing at a healthy rate, and uite up to the capacity of the existing carbuilding concerns to furnish e cars.

The only effect of legislation would be a congestion of orders and a nsequent great enhancement of cost before relief could be reached by e building of new shops or the extension of existing ones.

The present shops can probably construct cars up to the capacity f the roads to pay for them; and would also be equal, once the substitu- n has been completed, to furnishing all the cars needed for replace- ents and additions, and a great extension of the present steel car build- g facilities would hardly be usefully employed after the substitution steel passenger cars for the present wooden ones has been completed.

A careful estimate of the total cost of the substitution of steel pas- nger cars for the present wooden equipment aggregates the enormous tal of $614,619,100.

In the absence of legislation, I think it is probable that the important ads having heavy traffic, which roads most need steel cars, will first uip themselves, leaving the smaller roads to make the change as they e able to do so. The construction of new wooden passenger cars may said to have ceased, but it would seem to be a great and unnecessary rdship to force the disuse of all wooden equipment before the end of natural period of usefulness—this, speaking from the single stand- int of fire hazard.

Where wooden equipment is used, adequate fire extinguishing paratus would probably arrest nearly all fires at their inception.

Very truly yours,
A. W. GIBBS
Chief Mechanical Engineer

Mr. Evans: I will now read a paper, by Col. Dunn, on transportation of explosives, etc. A telegram informs me he cannot be present.

"SAFE TRANSPORTATION OF EXPLOSIVES AND OTHER DANGEROUS ARTICLES"

By Col. B. W. Dunn, Chief Inspector Bureau for Safe Transportation of Explosives, New York City

The general facts and conditions that make the transportation of explosives and other dangerous articles a problem of national interest are:

1. About 500 million pounds of explosives are manufactured annually in the United States. Much of this is shipped repeatedly, and it is estimated that a comprehensive check of our railway equipment would disclose at any time about 5000 freight cars loaded completely, or partially, with shipments of explosives. While the average quantity in a carload shipment does not exceed 24,000 pounds, the maximum may exceed 50,000 pounds, and frequently it is necessary to transport several of these cars in the same train. Our railways are not seeking this dangerous freight, but they accept it as a public duty. Commercial uses of explosives are being extended rapidly. To our military service, our mining industries and our construction work of all kinds must be added the farming industry when we list the prominent sources of demand for explosives. In the last fifty years the production necessary to meet this demand has increased in the ratio of 500 to 7.

2. The list of dangerous articles other than explosives includes the strong mineral acids and other corrosive liquids, oxidizing materials, inflammable liquids, inflammable solids and compressed gases. Under the regulations that have been developed to safeguard this freight, packages of dangerous articles are distinguished by labels and the freight cars containing labeled articles by placards. It is found that about 25 per cent. of the loaded freight cars bear these placards and this shows how large must be the total volume of this traffic.

For about six years the railways of the United States and Canada have been making a serious and concerted effort to reduce the loss of life and property due to explosions and fires caused by dangerous freight. This effort is based upon the following assumptions:

First—A complete and a practicable set of regulations is necessary to describe and apportion the duties of the manufacturer, the shipper and the carrier of these articles. The best knowledge and judgment of the three must be utilized in preparing these regulations. Each must be given ample opportunity to criticize the suggestions of the others and to defend his own.

Second—Regulations evolved in this way and pronounced satisfactory as a whole by the naturally antagonistic elements—the shipper and the carrier—are useless until means are provided for their uniform enforcement. They cannot be enforced by railway authority alone, on account of the competition between carriers for freight and the strong inducement to shippers to economize at the expense of efficiency in their shipping containers. The additional support of the Federal Government is necessary.

Third—After promulgation of the regulations by the Interstate Com-rce Commission under Congressional authority, that provide adequate alties for willful violations, an extended campaign with education and ection as the primary objects is essential to uniform enforcement.

The above policy has been followed conscientiously. A central organ-ion, the bureau of explosives, was organized and its work started in 7. Under the supervision of an executive committee, composed of minent railway officials, the work is directed by the chief inspector. ough conference committees appointed for the purpose the chief in-ctor is able at any time to get the advice of organizations of manufac-rs of explosives, acids and chemicals, charcoal, compressed gases, ches, etc., and of the various types of shipping containers. These resentatives are consulted in regard to all proposed changes in the es. It is exceptional that differences of opinion are not reconciled by cussion. It would be fortunate for the nation if the passage of all s could be preceded by as thorough dissection by technically well-rmed representatives of the interests that will be naturally antagonistic ler the operation of the law.

To educate the employees of shippers and railways in their duties ler the regulations, and to check by periodical inspections the perform-e of their duties, the United States and Canada are divided into ricts geographically and traveling inspectors assigned to them. strated lectures are given and reports of all work done are made by h district inspector to the chief inspector. The following table is ted from the annual report of the chief inspector for the calendar r 1912:

(See pages 240-241-242 for reports)

Col. Dunn's Paper—Continued

	1912	1911	1910	1909	1908
Total number of railway lines members of Bureau December 31st	290	228	174	172	158
Total mileage of Bureau lines December 31st	249,751	236,211	228,986	209,984	202,186
Total number of steamship lines members of Bureau December 31st	11	11	11	....	....
Total number of express companies members of Bureau December 31st ..	3	3	2	....	....
Total number of associate members of Bureau December 31st	35	30	32	33	....
Total number of inspections of stations	9,492	8,572	8,031	6,598	5,603
Number of stations receiving two or more inspections	2,489	2,195	2,342	1,839	1,309
Total number of inspections of factories	275	274	315	278	270
Number of factories receiving two or more inspections	77	85	102	75	69
Total number of inspections of storage magazines for explosives	1,762	1,561	1,528	1,292	1,540
Number of magazines receiving two or more inspections..................	447	410	452	349	361
Total number of boxes of high explosives condemned at factory	....	....	4,913	....	....
Total number of boxes of high explosives condemned as unsafe for transportation	4,798	6,591	10,902	10,029	4,852
Total number of kegs of black powder condemned as unsafe for transportation	399	1,205	1,291	1,468	531
Total number of cars in transit containing explosives inspected	1,936	1,412	647	475	448
Total number of cars in transit showing serious violations of regulations	456	210	235	168	197
Total number of express inspections	1,061	1,027	....	....	....
Total number of inspections of steamship companies' piers	83	72	69	69	....
Total number of inspections made by Bureau	14,609	12,919	18,615	16,087	8,959
Total number of lectures to railway officials and employes and meetings addressed on the subject of safe transportation of explosives and other dangerous articles	668	637	228	215	171

Col. Dunn's Paper—Continued

ACCIDENTS IN TRANSPORTATION OF EXPLOSIVES
1907 to 1912, Inclusive

	1912		1911		1910		1909		1908		1907
	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit and on Carriers' Property Awaiting Removal by Consignee
Number of accidents resulting in explosions or fires in transportation of **explosives** by rail..	8	1	8	2	5	11	3	9	9	13	79
Known property loss account explosions or accidents in transporting explosives by rail......	$10,200	..	$26,611	$8,150	$31,909	$11,727	$1,537	$1,136	$24,919	$89,710	$496,820
Number of persons injured by explosions in transportation	4	2	2	3	..	1	2	5	8	45	80
Number of persons killed by explosions in transportation	..	..	1	..	2	..	4	2	16	10	52
Total known property loss	**$10,200**		**$34,761**		**$43,636**		**$2,673**		**$114,629**		**$496,820**

Col. Dunn's Paper—Concluded

ACCIDENTS IN TRANSPORTATION OF EXPLOSIVES, RESULTING IN EXPLOSIONS OR FIRES

JANUARY 1, 1912 TO DECEMBER 31, 1912.

RECAPITULATION

	High Explosives		Black Powder		Other Explosives		Total		Grand Total
	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit	On Carriers' Property Awaiting Removal by Consignee	In Transit	On Carriers' Property Awaiting Removal by Consignee	
Number of accidents	1	....	1	1	6	....	8	1	9
Number of persons injured (not fatally)	1	....	....	2	3	....	4	2	6
Number of persons killed	....	....	....	....	....	....	....	....	....
Reported property loss, including railway equipment	....	....	$5,500	....	$4,700	....	$10,200	....	$10,200

B. W. Dunn, *Chief Inspector*

Address by Mr. A. Lindback, Ex-President Fire Marshals' Association of America

Mr. Evans: I will now ask you to listen to a gentleman who has come here from Canada; and I want to say more than a passing word in introducing him. When this Convention was proposed last Spring among the first we approached were two men who occupied powerful positions and had accurate knowledge about this subject, and he is one of these two. We wanted with us the State fire marshals in the aggregate, who compose an international association which was brought into being and was until yesterday headed by Mr. A. Lindback, of Manitoba, whom I will now ask to address you.

Mr. Lindback: As a Western man I shall not dwell long on the conditions prevailing here in the East. I must give you a little synopsis of the bringing into existence of the Fire Marshals' Association of North America. Seven years ago—and that was a time shortly after my appointment by my Government—I communicated with the fire marshal of Ohio with the idea and suggestion that the fire marshals should form an organization for mutual help and benefit, and at this time particularly I had in mind that when some of these firebugs we so generally hear have started their business in this country come to our country we would have some means to control them. We met in Washington, D. C., at the same time as the insurance convention because we didn't know how many of us would be there, and we felt we would have some backing if we met with a large organization. When we counted noses there were three States represented. We have had annual meetings ever since. At that time I regret we could not talk anything but fire incendiarism and firebugs, although some attempt was made to talk fire prevention.

At that time, 1906, I don't believe there was a single fire prevention association anywhere in the United States or elsewhere. To-day, if I am not mistaken, I think there are some thirty fire prevention associations throughout the West and East. When there was talk of starting a meeting in Washington on October 3d, and it was learned that this convention was contemplated, we didn't take long to decide that this was the place for us to meet. It was my hope, and it is still, that this fire prevention congress would influence some public sentiment, for without public sentiment back of us we will not get much farther than up to date.

The National Fire Protection Association, I understand, has been in existence for some ten years. That association has spent time, money, talent and effort to reduce the fire risk in this country. There is no question that they have done a lot of good work, but it has not yet reduced the fire waste much, which has grown from $150,000,000 to $225,000,000 per year during that period. Out of the work of that association some years ago the Fire Marshals' Association was evolved; and while in 1906 only seven or eight States were represented, to-day thirty-two States and three provinces all over the land have fire marshals. Many able papers have been read and able addresses made in our meeting here, so far, suggesting different methods to reduce fire waste; and one of the main suggestions, and one that really has a great deal of value, is that of inspections, although the Convention doesn't seem to have been able to fully agree about the manner in which such inspections should be made. When your Chairman asked me to come before you to-day I told him I had a short paper prepared for the occasion. He said: "Don't use that; just come and talk right from the shoulder." I merely come to tell you my opinion and views as I see them.

To go back to the fire marshal question again, I want to say, and I think you will agree with me, that there isn't any official of the State or municipality that owes more honor and duty to the local government and derives as much power as the fire marshal. He and his deputies or assistants have the power to visit any building at any reasonable hour and inspect it. He has more power than the insurance inspectors, who enter buildings more by sufferance than with power behind them like the fire marshal. When it comes to inspections I don't know of any body of men more appropriate for this than the firemen. They should have in view the learning of the construction of the building—how to get in and out. If they don't know anything about inspection when they start, by constant filling out of proper printed forms they will learn by experience before they go very far. In this country, I believe, as in our country the firemen are ex-officio assistants of the fire marshals, or should be.

Here in the United States the mistake is made of bringing the fire marshal under political influence. I think the average man appointed fire marshal knows little about the work he is to do when he becomes fire marshal. If he is of the kind of stuff our fire marshals have been made of so far, he learns within a year what he is to do and then takes interest in that work. But he knows that in four years he has to get out again. In many States his tenure of office is only two years. Now what interest or benefit can he accomplish from his experience when, after two years, he must go out and make room for somebody else? This question of reducing fire waste is so tremendous that I don't understand why it should be dealt with otherwise than like epidemics of smallpox and other contagious diseases. If a vessel approaches the shore with a contagious disease you keep it quarantined until you are sure the disease won't be carried into the country. In this country and ours we have gone so far along that line that we compel the individual to carry with him one of the collapsible cups as a sanitary measure. Those are measures that are bound to curtail disease and epidemics. You and we will have to use the same methods to curtail the burning up of created property. I have not spoken anything about what we are doing in Winnipeg, and I shall not bother you long with it; but a word here on the subject introduced by a countryman of mine, who touched upon the idea that the insurance companies should not be so willing to pay uninvestigated losses. In Manitoba the fire commissioner has power to condemn any premises or buildings which constitute a menace or hazard to itself or neighboring property. I have gone so far in Winnipeg as to tear down the whole south side of a street which consisted of old buildings—wooden buildings not used for anything—simply a menace to surrounding property. I had no trouble. I went to the property owners and told them what a nuisance they were and down they came. I have taken a good deal of your time but I have one more thought.

There has been here in the United States the idea that the insurance commissioner is ex-officio a fire marshal, and there has been a tendency to merge those two offices. If a fire marshal attends to his business and takes interest in his business, that office and his duties in that office grow tremendously year after year, and so does the office of the insurance commissioner; and I think it would be a great mistake if this nation, or we on the other side, should get the idea that the fire marshal's office is merely an office that can be merged with something else and not an office that will be able to produce results.

The first three to five years in Winnipeg it was very common to hear: "What is Lindback doing? We have just as many fires as before, and are still burning up property." I had to explain what I was doing as well as I could. While this report is not positive on what we are doing up there, the following figures will explain in a measure: Up to 1912 we burned up one and a quarter million dollars of value in the province of Manitoba each year. In the same time we have greatly added to our created property. From 1907 to 1912 we have built in the province of Manitoba $85,000,000 worth of new property. In all those years we have succeeded in not increasing our fire losses, and I claim that is one proof we have not been asleep on this effort in that section.

Address by Hon. Wm. C. Redfield, Secretary of the Department of Commerce of the United States of America

Mr. Evans: Gentlemen, we have been talking quite a lot here for the past two or three days, and to-day particularly, about intentions in fire prevention which we are helpless to carry out adequately in the single State, not to speak of the single city. There is a gentleman here now who can speak from the broad viewpoint of the nation with authority, and he speaks with peculiar authority on such a subject as this because he represents the economic expert view of the present administration. We don't expect too much paternalism from the Government in Washington, but we do always look for authoritative advice. I beg to present the Hon. Wm. C. Redfield, Secretary of the Department of Commerce, of Washington.

Mr. Redfield: Mr. Chairman and gentlemen, I ought not, as a layman, to speak to a body of experts because I cannot pretend to be anything but a layman—the layest kind of layman; and yet the problems you are dealing with here have been forced upon me rather against my desire, and to a certain extent I have had to address you on professional problems whether I would or not. I came to a realizing sense one day that our factory was liable to go up in smoke sometime or other, and the more I looked at the old-fashioned joisted construction, and the elevators going up through open floors, and everything constructed so as to burn readily, the more I realized what it all meant. Then and there commenced, in a factory at least, the process of self-education as to the prevention of fire. Then, as I told Mr. Evans the other day, it got so far when the job was done that when a man came up the office stairs on the other side of my office wall one day where I was telephoning and reported a fire, I finished my telephone message before I went down stairs. I knew it could not get very far, and in fact it only damaged one side of the stair.

In connection with this particular system I had occasion to consult the man whom you all know of, the late Edward Atkinson. I remember talking with him in his office in Boston, and he spoke the words which have since become famous—that the best thing to do was to "put in all the fire pails for which you have room, and then put in some more." I remember clearly the education he gave me in the three-fold theory of his particular kind of insurance company. First, that it hadn't any business to pay losses, for no losses should happen; secondly, if by some inexcusable oversight or by act of God a fire did occur, it should not spread; and then, if those two things happened, you should be in shape to put it out right away. I remember vividly what he said in this respect and the work he and his colleagues did in putting into effect his philosophy. We did it in our factory for twenty years: first, there was no excuse for fire; and, if it did occur, it should not spread; and if it did spread, it should be put out. Those three functions have been in my mind ever since as the fundamental laws of protection against fire. I have put into writing a few things for to-day (not that I shall confine myself to them, for I shall not). There is a great deal to be said, but out of mercy to you I thought it better to confine myself rather than let myself go on a subject so important.

The first thought occurring to me now is of another experience of mine in another field. Mr. Evans has spoken to me and written to me as to the importance of certain definite compulsory minimum requirements in the way of fire protection. I believe in those things heartily. I hope there will come as the result of this gathering and the work from it certain minimum local requirements which may be made, as far as possible, uniform everywhere, so far as differing conditions permit. I don't want to be understood as anything but a friend of this proposition; but I remember very vividly, when Commissioner of Public Works in Brooklyn, an experience I had in administering a perfectly well-defined law against a hostile or inert public opinion, and this was the case: The State highway law governs the streets of the city of New York. They are not governed by city regulation but by State law. The law is perfectly well defined and requires that there should be no obstructions. Decision after decision had mulcted the city by obstructions in advertising matter, showcases, signs which fell—by commonplaces which you don't have to go more than a mile in any American city to see. Human life had been lost—one case of a woman who had a heavy portable showcase blown against her; and it killed that woman, while others were injured. There was no question as to the law—as to its existence on the books or the view the courts took of it. That seemed a plain case for an executive officer to handle. The moment I tried to execute that law I ran squarely up against inert public opinion. They didn't care, and were not educated up to the point of wanting the streets clear. It was inert until I tried to execute the law; then it became extremely active against the law because it inconvenienced people. Men who had trunks out on the sidewalk didn't care if people fell over the trunks and hurt themselves. A man who sold more collars and cuffs by having a showcase on the sidewalk didn't care if it fell over and hurt a woman or girl—if he sold more collars and cuffs.

Another matter about the law. You are Americans and know as well as I do what the average attitude of the average uninformed man is against a law that is enforced and that he does not understand. It is part of our American psychology, the way we are made up—a vital defect in our whole policy. Laws are good. Let us have all the good laws we can; but they are useless unless there is a public opinion behind them to aid in their enforcement. I can name two States in which there are game laws. In one State there is no public opinion back of the law, and dynamiting is performed in the streams; and the enforcing of the law would be judged by the public adversely. In another State there is a public opinion back of the law and it is a vital thing.

I believe there should be definite standards and laws that can be enforced, and especially against the small property owner. The large owner either looks after it or the insurance people will force him to.

Your filling the books with laws and your appointing the officers, however conscientious—observe, it is not the fault of the officers, but an officer can no more enforce a law against a public opinion that is hostile or inactive than he can fly in the face of Providence—it is simply prolonged suicide. It also means retirement from public office at the end of the term, as it did mine.

Therefore, to my thinking, the job you have got to do and I have got to do, is to create a public opinion to make the laws effective. Take another example. It has been very successfully done by another society, and perhaps a leaf out of their book will do no harm. Take the question of the awful waste of boys and girls in this country. We burn up $300,000,000 worth of property in fire—that is a joke in comparison to the boys and girls we burn. We burn them up at the school, for when they come out they are not able to do anything practical. There are no means of teaching them. We corrupt them by the dens of vice, without an idea of the education needed for the work of life. They are wasted; and the society in which I am interested is endeavoring to deal with that fearful problem. It is literally a fearful one. In it are all sorts of things that make the mechanic's home sad and destroy our women. It seems easy to get laws.

Oh, no! First of all, you must define the problem so the average man can understand it. I have always regarded a fire insurance policy as a sort of linguistic joke only exceeded by a marine insurance policy. I don't believe there are 25 men on the street, reading one through for the first time, who could get through it without a lexicon. I never could understand the intricacies of a marine insurance policy. I don't wish to now. My son may grow to it, but I don't care about it. What we need is to get a lexicon so as to understand the problem we have to combat. This was the course we had to pursue in our society. The next thing was to define a policy based on that problem. First we had to know the language—a language to define that policy. After we had the language we had to make up a policy. It took a year to get up a reasonable minimum policy which would cause no unreasonable hardship. Then we got to work with a first-class man, paying him $6000 to do nothing but deal with legislative functions and decisions. At the end of the first year four States had enacted legislation: Indiana, Pennsylvania, New York and New Jersey.

I am going next Wednesday night to the convention in Grand Rapids to report. We are now negotiating with thirteen States to do the same thing. But more has been accomplished in two years, or one year, after the language was plain and a policy written in that language, than was done in ten previous years of effort. I think that is scientific. It agrees very much with what my good friend, Mr. Evans, has spoken of to me. There are clearly defined standards. We are going to the State of Michigan to talk to them, using the same language as in Indiana, New York and Pennsylvania. It is the same language and means the same thing. It has been reasonably thought out—and it goes.

But if we stop there we would not succeed, vital as this subject is. The processes have kept at work, and there are men at work in the field doing nothing else. If there is a convention of any sort where the gospel can be preached, a good man goes and preaches the gospel there. He goes to a labor union and asks them what they will do with the boys and girls. Just as I think this society might do if they established first in untechnical speech what the society stands for. Then formulate definite standards in non-insurance language. Then put out into this country the simple gospel of protection against fire. I see that man, in my mind's eye, going into a farmer's grange and talking to them as farmers, not as insurance men. The farmer does know, if you talk to him in plain Saxon, that so many chances to one his house will burn up that way. Tell him how he can stop it. You tell him about his neighbor's barn burning down and the loss it meant and say: "Now if you don't want yours to burn down, this is what you must do."

It is the idea of getting down to the everyday man with simple things. We are sending men abroad to study all sorts of things. One man is going to China and Japan to learn about spinning cotton, and coming back by way of India and England. He isn't going to write that up. A busy man cannot read half the useful pamphlets that come to his desk: But in conventions he will tell you what he has seen in Japan and China about cotton. He will go all over America putting into the minds of men, face to face, the things he has learned in his travels. That is the policy you must carry out, because, my friends, you and I must not forget that the American people as a whole are quite indifferent to the matter in which we are interested. Don't let there be the faintest mistake as to that part of our truth.

We are a wasteful people! We have been brought up to waste. We have wasted everything we have. We have wasted our land so that a great deal of it is no longer good for modern cultivation. We have wasted our forests until they are largely gone; wasted our fisheries so that my own department is hatching 4,000,000,000 eggs to make it good; wasted homes and buildings by fire; wasted boys and girls by lack of teaching them anything to do that is useful.

We are a wasteful people! We came into this land where there was so much we didn't know what to do with it all; but if your wife tells you the price of beef, you will know the cost of wasting our cattle. Now we are wasting our calves. My wife was charged 50 cents a pound for calf's liver which I used to think was a cheap article of food. When you tell the people about the waste from fire it doesn't appeal to them. Why should it? We are used to having waste, because our whole mental bent is that waste is a normal condition. We have not yet been shocked out of it. This beef question is beginning to do it.

When you say there are $300,000,000 wasted in fire it would not make an impression. It would impress a Frenchman or Englishman or German. It doesn't impress us. You go into Chicago or New York and say to a man: "We waste $300,000,000 a year in fire!" What will he say? He will reply: "I am busy; I don't care about that." It is supposed to be an almost normal condition, to waste.

You have got to have the people know that this thing is disgraceful before you can get any laws that will be effective. Get this thing, in the common methods of advertising the facts, before the American people, that this thing is a shame. It isn't a matter of $300,000,000 wasted; but if you put it as a thing unmanly and a national shame, and especially if brought down to a locality as a shameful thing to happen in that locality, you may accomplish something. But what is the use of legislation if the people who govern (and in this country the people do govern) don't want it? I wonder if you think that is extreme? I will give you an illustration of that. I speak of that in this language:

We have stored in a flimsy building at Washington a series of steel and aluminum plates, saved since Revolutionary times, of charts of our rivers and harbors. They could never be replaced. There would be vast confusion and serious loss if they were to be even seriously damaged. Yet an appropriation for this, $6400, was omitted; and when it was brought up again in connection with the pending Urgent Deficiency Bill it was again left out. I do not say this at all in criticism. The committees may be right in their view that it is not an emergency in the sense that it should be included as such in the pending bill. The sole point I make is that facts of this kind do not seem to affect the American mind until after the loss occurs. The gentlemen before whom it was put are able and sincere and most anxious to do the wise and even liberal thing. They simply do not see it as I do.

In like manner there are in the Bureau of Census invaluable records reaching back to 1790. In taking the census in the older days records were made of the heads of families in such a way that each of those censuses is invaluable for genealogical purposes for tracing the heirs to estates, establishing rights to pensions, and for many other essential facts. They are constantly consulted for these purposes. There are no other records of the kind; and these, if they are lost, cannot be replaced. When I brought up the question of the condition of the Census Building as respects the fire risk I was told there was a fireproof vault. There is, but it is so small that none of the records of which I am now speaking are in it. They are exposed to the risk of fire in a building which makes no pretense to be fireproof.

The charts of the harbor of New York were called for the other day in the settlement of some shore-front property. They could not be replaced.

I am in the most complete sympathy with Mr. Evans and you gentlemen in what you aim to do in regard to standards of fire protection and the establishment of a compulsory minimum standard which shall not be a hardship. But what do you suppose could have been done three weeks ago in regard to getting vessels to change conditions as to fire risk in their holds? Suppose I should say the steamboat service insists on radical change in the holds of vessels, in harbors, especially on steamers carrying passengers. You know as well as I the criticism and resistance it would give rise to, and with nothing done.

The path is easy for protecting, but it has cost—what? One hundred and thirty-six human lives! You fire insurance men, how many human lives has it cost to get a theater properly protected? It is the peculiar psychology of the American people, who take risks cheerfully. The laws we get (and I hope we get many of them) will do no good until we get an enlightened public opinion to back them. That is the serious fact with which you have to deal.

It has been my duty within the last few weeks to deal with this important subject, and the President has given me authority to take that subject up. It is one point on which we put a great deal of weight now. Did we two years ago? Is the public opinion more acute now than it was two years ago? Why are thirteen nations getting together to work on this subject? Why have we in our department spent so many weeks to get data together for the meeting in London? After we killed 1100 people one night, then we began to think. Only a few days ago we killed 136 people, and then we thought about it some more.

I don't like to speak about it in this way. It isn't a pleasant way; and you here are alert to the subject. But isn't it the fact? Isn't it the problem to illuminate this mental darkness—to get people to care? If a house or two burns in Pittsburgh the chap in Chicago should regret it if it is unnecessary. Now it only interests a small number of highly intelligent men who are professionally concerned. It is a shame to me to be abroad and be told that we spend $300,000,000 a year wasting money in this way. Just as we are told we waste so many children to celebrate the Fourth of July. That is the way they put it to me abroad.

It is part of our National wrong, and we have got to undo it. Don't, however, think we are going to do it this year or next. It must be a gradual growth. It is a good thing you are here to start this, but don't be discouraged if five years hence the country is not all illuminated on this thing. It won't be. We all believe in good roads. Yes; we all do, now that we have so many automobiles. But an old farmer down in Virginia said: "If your good roads increase my taxes one dollar I don't want them."

This is not what I had written down to speak, but I am glad to take the facts as I see them.

I understand you passed some resolutions this morning in which you wish the assistance of the Bureau of Standards of our Department. The Bureau of Standards is a very good place. I should like to have you come in groups, to show you about it. It has a great reputation for doing things well. It won't touch them unless it can. It is asking now about $600,000 more per annum than last year, because it has so many more things on its hands. For instance, the determining of the metallic composition of carwheels and axles so as to prevent the sacrifice of human life. But it is not in the position of going to Congress and asking for more work to do. It has enough to do now. So I am glad you have some good sense in your resolution and have appointed a committee to wait on our Congressional fathers. You see an official cannot very well go to Congress and ask for an enlargement of his power. We have 15,000 miles of coast line in Alaska to look after. We have one department of four men, and no boats. When I think of more work I think of the work I am charged by law to do and cannot accomplish. I would be glad to take up your subject. If a request from your body is submitted I shall send an approval of that bill back; but there my function ends until we get the money. But even there "the more haste the less speed." The Bureau of Standards doesn't do work on the gallop, otherwise it wouldn't be well done. It has the reputation of not having to recall things when once done. We prefer not to have "the recall" in the Bureau of Standards.

I don't know that there is anything more I can or ought to say. With anything that looks toward diminishing this awful, shameful waste I am in hearty accord. The practice on which the diminution of that waste ought to go is perfectly clear to me. It ought to be the same principle on which physicians combat disease—unselfishly trying to destroy that which makes for their own professional existence. And the destruction of fire as a waste must go on—if it will succeed at all—must go on contrary to the point of view of the average man, making his life less disturbed and more resultful, rather than from the point of view of anyone or any group of interests.

Furthermore, the Bureau of Standards, if it undertakes it, must work n the interest of everybody—the everyday man—so that if it deals with he subject at all it must deal with the whole subject and on the principle of the New Freedom.

Furthermore, because of the evolution upward which is so clearly going on all over America, and because of its being a part of the evolution upward, I speak of it to you as a relatively slow thing; for construction s always deliberate and any policy which is to be a constructive policy must be a deliberate policy. Mushrooms grow in a night, but don't stay; nd the animals and the causes having the longest infancy have the longest ives.

Mr. Evans: I think you will all agree with me that we are glad he "Commissioner" was discharged from that board in Brooklyn so he ould come here to-day as the Secretary of Commerce of the United States and give us this illuminating talk on economics.

FIRE HAZARD IN WATER TRAVEL

In connection with a few of his remarks place has been reserved in ur current program for the consideration of the fire hazard on boats and hips, which will next be laid before you.

I have letters dated October 7th and 8th from the Department of Commerce, Steamboat Inspection Service, Washington, which point out he Federal statutes and activities on this subject:

Department of Commerce
Steamboat-inspection Service

Mr. Powell Evans Washington, October 7, 1913
Chairman Fire Prevention Commission
Department of Public Safety
Philadelphia, Pennsylvania

Sir:—In further reference to your letter of September 25, 1913, nd the Bureau's acknowledgment of the 26th, you are now further advised that the organization of the United States Government with respect to controlling the construction, protection, equipment, and management of boats and ships on inland waters and high seas with respect to fire danger is entirely covered by the Revised Statutes of the United States:

"Title III.—Regulation of Steam Vessels" and the "Rules and Regulations of the Board of Supervising Inspectors," which Board is authorized under Section 4405, Revised Statutes, to "establish all necessary regulations required to carry out in the most effective manner the provisions of this title * * * and such regulations when approved by the Secretary of Commerce, shall have the force of law."

In order to make this paper perfectly clear and useful to your Commission, there are forwarded under separate cover copies of Forms 800 and 801 of the Department of Commerce which are, respectively, "Laws Governing the Steamboat-Inspection Service" and "General Rules and Regulations prescribed by the Board of Supervising Inspectors," to both of which reference will hereafter be made.

The Government exercises no jurisdiction over the construction of ships with regard to fire risk, but, as will be seen by this paper, makes ample provision for protection and equipment of the ship as a whole.

Section 4417, Revised Statutes, provides that "The local inspectors shall, once in every year, at least, * * * satisfy themselves * * * that all the requirements of law in regard to fires, * * * pumps, hose, * * * and other things are faithfully complied with," and if any inspector shall find on board any such vessel any "fire hose so defective as to be incapable of repair, he shall require that the same be destroyed in his presence by such owner or master."

Section 4422, Revised Statutes, provides for the transportation of gunpowder in properly constructed chests, safes or compartments at a secure distance from any fire.

Section 4453, Revised Statutes, provides that whenever any * * * inspector ascertains to his satisfaction that any vessel * * * has been or is being navigated without complying with the provisions of law and her said certificate as to the number and kind of fire-fighting apparatus, or without maintaining in good and efficient condition her * * * fire pumps, fire hose, * * * he shall order the owner or master to correct such unlawful conditions, etc.

Section 4470, Revised Statutes, provides for the installation of suitable pipes and valves to convey steam, carbonic acid gas, or other fire extinguishing gas or vapor to the hold, and to the different compartments thereof, to extinguish fire, and also provides for the security of stoves and protection of woodwork exposed to ignition.

Section 4471, Revised Statutes, provides for pumps and fire hose.

Section 4472, Revised Statutes, prohibits the transportation of dangerous articles or explosive burning fluids on steamers carrying passengers.

Section 4497, Revised Statutes, authorizes the Board of Supervising Inspectors to require steamers carrying either passengers or freight to be provided with good and efficient portable fire extinguishers.

Section 4483, Revised Statutes, authorizes the Board of Supervising Inspectors to prescribe a certain number of fire buckets, axes, water barrels and tanks to be in readiness in case of fire.

Section 4492, Revised Statutes, provides that barges carrying passengers must be equipped with fire buckets and axes.

From the above it will be seen that the entire Government scheme of fire protection on merchant vessels under its jurisdiction is covered very specifically by the provisions of the sections of the law quoted, and which may be readily found in their full verbiage in Form 800. The rules and regulations to carry into effect the provisions of the law relating to this subject are incorporated in Rule IV, page 86, Form 801, and will, I am sure, be found quite consistent and complete in detail. There are no gaps or overlaps and the whole scheme of fire protection is administered by the Department of Commerce through the Steamboat-Inspection Service, and we feel that it is quite thorough and up to date.

Respectfully,

Geo. Uhler

Supervising Inspector General

Mr. Powell Evans October 8, 1913

Chairman Fire Prevention Commission

Department of Public Safety

Philadelphia, Pennsylvania

Sir:

In further reference to letter to you from this bureau under date of th instant, in regard to fire protection regulations on vessels subject o the provisions of the Steamboat Inspection laws, you are informed hat a more detailed statement might have been made in regard to that art of Section 4472, Revised Statutes, relating to the transportation of otton. Section 4472, Revised Statutes, provides, among other things, hat no loose cotton shall be carried as freight or used as stores on any teamer carrying passengers, and also provides that baled cotton or hemp hall not be carried on such steamers unless the bales are compactly ressed and thoroughly covered and secured in such manner as shall e prescribed by the regulations established by the Board of Supervising nspectors with approval of the Secretary of Commerce. Pursuant to his authority conferred by Section 4472, Revised Statutes, the Board of Supervising Inspectors has provided in section 5, Rule IV, General Rules and Regulations, that all baled cotton shall be securely bound and overed with bagging on at least three-fourths of its surface, including oth ends of the bale, and that no bales of imported or domestic hemp hall be received on any vessel carrying passengers unless the same are roperly compressed, bound with rope, wire, or metallic bands, and overed on ends or sides, according to the several methods now practiced n foreign and domestic trade.

The above regulation, passed by the Board of Supervising Inspectors nd having been approved by the Secretary of Commerce, has the force f law.

Respectfully,

D. N. Hoover, Jr.

Acting Supervising Inspector General

Mr. Evans: The following letter from Capt. Benson, Commandant of the League Island Navy Yard, Philadelphia, is now appropriate. It affords further expert data on the subject in hand.

NAVY YARD, PHILADELPHIA, PA.
COMMANDANT'S OFFICE

MR. POWELL EVANS October 15, 1913
Chairman Philadelphia Fire Prevention Commission
Room 420, City Hall, Philadelphia

DEAR SIR:

1. Replying to your letter regarding the methods to be followed in attempting to insure safety aboard seagoing vessels, I regret to say that the pressure of official business incident to taking over a new command has prevented not only my giving you an early reply but of going as deeply into the question as I would like. There are, however, a few points that have been impressed upon me during my naval service which I consider of vital importance:

First—In the construction of passenger ships it has seemed on all occasions where great loss of life has occurred that had the ship been provided with from two to three absolutely solid athwartship bulkheads the great loss of life in all probability would have been prevented. Hence I have no hesitation in saying that ships carrying passengers, particularly large numbers of passengers, should have at least three complete watertight and airtight athwartship bulkheads extending from the outer skin of the ship at least to the under side of the main deck, thus dividing the ship into four watertight and airtight compartments. Of course it is understood that these bulkheads may have to be pierced for certain equipment, but anything passing through them should be made thoroughly tight by means of stuffing-boxes and other devices.

Second—Probably the most fruitful cause of fire on board ship is due to spontaneous combustion, which may be produced by oily waste or clothes, clothing or waste saturated with paint, and other material left in warm and improperly ventilated spaces below the decks. This I believe to be one of the most fruitful sources of fire on board ship and should be obviated by forbidding such material being stowed below and insisting on these regulations being carried out by frequent and careful inspection.

Another very fruitful source of fire on board ship is due to improper insulation of electric wiring. In passenger ships particularly the electric wiring should be in a metal conduit and the greatest care should be taken to make it practically impossible for fire to be caused from this source.

In modern ships carrying quantities of oil and such material the greatest care should be exercised to insure sufficient ventilation and escape for the oil fumes.

Cigarette smoking is a very fruitful source of fire on board ship and only the most stringent regulations enforced by the severest punishment can prevent fire from this cause.

2. Under certain conditions, of course, after a ship is once on fire, unless she is protected as above recommended and proper means are supplied for controlling the fire within this space, thus giving the passengers some part of the ship to which they can retreat with safety, the only way of escape is by means of an ample supply of boats and life preservers, the handling of which is left under the supervision and direction of another department of the Government.

3. Regretting that I have not had the opportunity to give this very important subject more time and attention, and with a high appreciation of the excellent work that you are engaged in, and with best wishes for its success, I am,

Very sincerely yours,
W. L. BENSON
Captain U. S. N., Commandant

MR. EVANS: The following letter from Mr. Hand, General Manager of the Cramp Shipyard, Philadelphia, gives us still further expert opinion on this subject:

THE WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
OFFICE OF THE GENERAL MANAGER
PHILADELPHIA, U. S. A., Sept. 26, 1913

SUBJECT: Immunity of Ships from Fire Damage.

MR. POWELL EVANS
Chairman Fire Prevention Commission
Department of Public Safety
City Hall, Philadelphia, Pa.

DEAR SIR:

We beg to acknowledge receipt of your letter of the 25th instant, requesting us to send you a statement expressing our views as to how boats and ships are to be built so as to be reasonably immune from fire damage in actual use, both to people and property. The subject is an extremely important one and is far-reaching in its effects. It is possible to build a passenger vessel which will be reasonably immune from fire, but there are two reasons which operate against the construction of such a vessel. The first one is the very greatly increased cost due to building a vessel of metal and the elimination of woodwork throughout the construction; the second is that such a vessel is not a comfortable one for the traveling public, due to the fact that the metal bulkheads are excellent conductors of heat and sound, so that after insulating as much as practicable noises in the ship can be heard from one end to the other with distinctness. It seems possible, however, to make a compromise for passenger vessels between an all-metal construction and wood joinerwork, whereby as much as practicable of the ship be made of metal and the living quarters of wood, subdivided into fire sections which are separated one from the other by fire bulkheads which would prevent the flames from sweeping the ship structure. In addition to this, sprinkling apparatus, regulated by thermostats, can be installed, whereby water is turned on to any section where fire originates. We have built vessels of this type, notably the Fall River Line Steamer *Commonwealth,* which has been running a number of years without fire damage.

The subject is such an intricate one and one that requires to be looked into from so many points of view that it is impossible to do more than outline such a scheme as given above in a letter; but we are of the opinion that very considerable advance may be made over the ordinary vessel carrying passengers for hire, in so far as protection against fire is concerned.

Yours very truly,
THE WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING COMPANY,
H. W. HAND
General Manager

Mr. Evans: The above is the story on control of fire hazard in boats and ships as far as I have been able to obtain it on short notice. The shocking story in last Sunday's papers of the destruction by fire of the steamship *Volturno* with approximately 140 of her passengers and crew in mid-ocean lends sad point to this topic here now. The following newspaper clipping is of interest and importance in this connection:

SAYS PUBLIC DEMANDS VESSELS BE FIREPROOF

ENGINEERS' JOURNAL CALLS ATTENTION TO BLAZE ON THE IMPERATOR

URGES NEW APPLIANCES

Calling attention to the fire which, on August 24, damaged the steamship *Imperator,* the mammoth German liner which represents the highest type of steamship construction, *Safety Engineering* in its current issue makes the point that a fireproof ship is now demanded for public safety not less than an unsinkable ship.

It is stated that to extinguish the fire which started early in the morning in the provision hatch of the huge vessel it took five hours with the combined resources of the ship, the Hoboken fire department and a New York fireboat to flood the compartment where the fire raged with 2,000,000 gallons of water.

"While the size, design and construction of the *Imperator* assures her buoyancy and entitles her to be called collision-proof," says *Safety Engineering,* "there absolutely is not a thing about the ship that justifies the use of the term fireproof. The *Imperator* is not too big to burn. In fact, the enormous size makes the ship relatively more combustible than smaller ships.

"It is urged that passenger steamers, as buildings, should be provided with automatic sprinklers, and that such equipment is perfectly feasible and practical. That fire at sea is a real and ever-present menace, statistics are presented to show. During the 7½ years to June 30 no fewer than 155 steamships were burned completely and 2447 partially. Throughout the world a steam vessel has burned, wholly or in part, every day during this period."

Note—The London Safety-at-Sea Conference, participated in by representatives of most of the principal Governments, has been held since this Convention, and has initiated many corrective measures in the *construction, protection, equipment* and *management* of ships to greatly reduce their fire hazard for all concerned.—Ed.

FIRE HAZARD IN MINES

Mr. Evans: We will now hear a very authoritative opinion on mining fire hazards by Mr. H. M. Wilson, Engineer in charge of the Experiment Station of the Bureau of Mines, Department of the Interior, Pittsburgh, who developed the safety methods now in vogue in mines in this country.

Mr. Wilson: I feel especially fortunate in the opportunity to present to you this subject so immediately after Secretary Redfield has given us his most illuminating talk concerning the importance of education as a means of combating the fire waste.

There are a few of you here—Mr. Hexamer, Mr. Goddard and some others—who recall that the underwriters have put forth to the people of the United States year after year the fact of the enormous waste in values from fires in the United States, and yet how much attention was paid to their statements until 1907 when the Conservation Commission prepared a careful statistical review which was issued as a Government document? This verified practically everything the underwriters had been preaching, but it required the unimpeachable authority ot the Government to announce those facts to convince the people of the United States that they must be true.

There had been fires in mines all over the United States, as abroad. Men had gone down into mines and lost their lives year after year and we heard the facts again and again. It was like the account of a theater or school fire where a few lives were lost—usually more in the case of a mine disaster—and we heard it and forgot it. The Government took the responsibility of trying to limit that waste in human lives and property in mines, and created the Bureau of Mines, which showed from 1907 to 1910 that for 25 years there had been a constantly rising curve of the number of men killed per ton of coal mined, and in the number of fires, explosions, etc.

The Bureau of Mines has not tried to limit these by its own force but by education and by teaching well-known means whereby they could be combated; until in 1907 the increase in life loss per annum showed no rise for the first time. Since then the rate has decreased until within the last few years there was not over 4 men killed per thousand tons. It is now 3 per 1000. The number of men killed is 1000 less than three years ago, although the amount of coal production has been increasing in that time.

Can you point anywhere in the United States to an equal aggregate reduction in the amount of loss of property or life on the surface? You cannot; for that reason in the paper presented by me yesterday, discussing Mr. Evans's paper on minimum standards, I suggested that if you gentlemen feel that it is desirable that you petition Congress, as you seem to desire to do, that you put the matter up to Congress in such manner that they will be able to determine for themselves how the enormous waste in fires can be best reduced. I believe it can be brought about, as splendidly brought out by Secretary Redfield, by nation-wide education brought home individually to every man involved, and not necessarily altogether by written matter.

To illustrate how that policy has been carried out in relation to the mine disasters I would say that the bulk of our success has not been in issuing circulars, but in lecturing, demonstrating, talking and teaching in the field; by means of eight cars going all over the United States to which men trained in fire-fighting methods are attached, with magic lanterns showing appropriate views. In addition to the eight cars the service operates six rescue stations doing the same kind of work. Throughout the United States our men are attending every kind of meeting where they can reach the audience. To-morrow night, during the American Mining Congress, there is a motion-picture lecture on "Mining and Safety in Mines," with demonstrations by men trained in fire-fighting and mine rescue. The Bureau of Mines isn't to be credited with doing anything but broadcasting the propaganda, and the result is in the statistics I quoted.

Referring now particularly to my paper, which follows these remarks on the principles and practice of combating and controlling fires in mines as distinct from fires on the surface: one of the main causes of mine fires is carelessness, and mine fires are occurring daily throughout the United States. In particular, where coal is especially inflammable and prone to be ignited, fire-runners are employed—men whose duty it is to go hourly through the mines looking for small fires and putting them out. I have endeavored to portray the principles governing mine fire-fighting underground where men cannot approach the fire closely because of smoke and have difficulty in getting about much greater than in a building. The reduction of mine fires in the United States, so far as the origin is concerned, follows from *educating the operators* by the Bureau of Mines through its technical papers and addresses; and *educating the miners themselves* by personal contact and speaking to them in their own language by miners educated by us to do so.

The scientific methods which have been brought to the attention of operators, including the use of artificial breathing apparatus in combating new mine fires, have been such that you can say without fear of contradiction that within the last five years no such fire has gotten beyond control. There are raging now, however, all over this country mine fires which have been burning ten, twenty and thirty years which are far beyond control and have already consumed millions and millions of dollars worth of property. The means by which these old mine fires have been kept within control (and these are not parallel cases with any surface fires) have been in the development of scientific methods in approaching the fire; in studying the fire where you cannot see it or get to it; and chiefly by analyzing the causes, learning when a fire is being smothered, and approaching with the artificial breathing apparatus and erecting a stoppage to turn it back—which is a simple operation to-day.

MINE FIRES—CONTROLLING PRINCIPLES, ETC.

Fires in mines have their origin in causes many of which differ diametrically from those in surface structures. The principles governing their control are also, in many cases, entirely different from those applying under surface conditions. The methods of prevention are not materially different from those applicable to the prevention of surface fires, as they are aimed in large measure at carelessness, the prime contributing cause in mine as well as in surface fires. These differences in principles and practices are much more marked in coal mines than in metal mines because the former contain explosive and non-respirable gases.

Taking up first the conditions applicable to both classes of mines: mine fires originate from two general causes, either from introduction through shafts or entries from surface fires, or in causes originating underground. The former may be propagated from fires in the surface engine or fan house or similar buildings, or from forest or brush fires. These may drop embers down the shaft or be carried through the timbering to the interior. Protection against such fires is simple and consists in keeping all inflammable structures at a distance of one hundred to two hundred feet from the mine opening and keeping all timber or brush cleared to a distance of five hundred feet therefrom; in particular in constructing engine houses and fan houses of non-inflammable material, and with fire-resistant floors.

Fires originate in both classes of mines in the shaft or entry, and especially at shaft bottoms or landings where a large number of men collect while changing shifts. Here the miners change the wicking of lamps or discard candle ends, throwing them carelessly among inflammable trash or against timber.

Since the integrity of shafts and entries is essential to the escape of men and to the rendering of assistance from outside, they should be protected by being constructed of non-inflammable material, such as steel, or preferably reinforced concrete posts and timbering with lining of brick or concrete.

Through shafts and entries are also carried the ventilation, the piping or wires for power and the mains for supplying the water for fire protection. It is evident, therefore, that the largest measure of prevention as well as protection is provided if these most vital parts of the mine, the entry and shaft surroundings, and the main entries or gangways are properly protected.

The first and most vulnerable point underground where animal haulage is employed are the stables. Here prevention should be by the handling of hay and other feed into and out of the mine in closed metal cars; not more than one day's supply brought in or left within the mine, and such inflammable material should be stored in a separate fireproof chamber adjacent to the stables. About the stable there should be no inflammable material, safety or automatic doors being of metal; stall partitions and feed boxes of metal or reinforced concrete. A second vital dangerpoint is in any office, store room, pump or engine room at the shaft bottom or at the end of the main entry. The same precaution as recommended for treatment of the shaft and of stables should apply at such points, special care being taken regarding the disposal of oily waste and other inflammable refuse, for the receipt of which fireproof receptacles should be provided and should be carried closed into and out of the mine. Otherwise, and wherever there is inflammable material about shaft or entries, surface or underground structures there should be installed an adequate automatic sprinkler system with adequate water supply properly protected from freezing.

In both classes of mines, fires frequently originate from carelessness in throwing wick ends and candle ends; from spontaneous combustion, and less frequently from electric wiring. The same precautions required in surface structures apply to matters of carelessness and electricity underground. Spontaneous combustion due to friction of sliding ore masses along walls where there are large sulphite ore bodies in metal mines frequently develops sufficient heat to cause fire. In some metal mines such fires are of almost daily occurrence. They may be minimized by use of non-inflammable timbering of metal or concrete, or by use of the largest size and least amount of timber possible; and they may be combated by construction of concrete bulkheads or back ventilation with pressure sufficient to hold gases where there may be a fire. In coal mines spontaneous fires are frequent, especially in the "gob" or refuse piles; such fires occur several times daily in some mines containing coal which absorbs oxygen rapidly. They may also originate in the "bug dust" or machine cuttings. Spontaneous fires also originate in waste timber in both metal and coal mines, especially in the latter if covered with fine dust or sulphur, and in the former from sulphur balls. The best protection against these is frequent observance of the gob and timber, and the removal from the mine of machine dust and waste timber and sulphur. For fighting such fires emergency doors may be provided which can be closed air tight when the fire starts.

Fires originate quite frequently in coal mines from ignition of small bodies of gas which flame in the presence of open lights; occasionally from open lights being struck near timber or other inflammable material. The protection against such fires is the use of electric lights and of safety lamps.

Another frequent cause of mine fires is the use of explosives, and as an after result gas and dust explosions in coal mines. Coal mines may be fired through improper use of explosives, especially with use of weak detonators causing a flaming explosion; or inflammable gases may be ignited by the explosive, small gas feeders being not infrequently of sufficient volume to cause a flame but not an explosion. A protection against these is a careful examination of the working face before a shot is fired, and the prohibition of open lights in the neighborhood of the working place for five minutes after the firing of a shot. Carelessness in failing to extinguish small fires ignited from any of the above causes not infrequently results in serious fires getting beyond control. A further protection against such fires is keeping handy at the working place where inflammable gas is known to be present, water barrels with buckets or boxes of sand which may be thrown on the first flame.

After almost every explosion within a mine, fires are started in different parts—in timber, gob, coal, and brattice cloth. As a precaution immediately after an explosion all electric power wires should be disconnected. The ventilation should not be restored in advance workings until explored by men wearing breathing apparatus, lest the oxygen in the fresh air fan incipient fires into flame. If, on the other hand, explosive gas is not liberated in the mine, ventilation should at once be restored for the benefit of men uninjured.

Mines should be protected by a proper system of fire patrol. This may be had by the regular force of foremen, shot firers, and inspectors if of sufficient number. Otherwise, as is the practice in fiery mines, to patrol by so-called "firebugs" or "runners," who are in fact firemen. There should be an adequate organization for fire-fighting, the foremen and assistants dividing the district to be patrolled among English-speaking men to whom various duties should be assigned. A great protection against the spread of fire is an adequate alarm or telephone system.

Portable fire extinguishers of a type differing slightly from those used on the surface should be available for fire fighting within mines, as also chemical extinguishers carried on mine trucks, and there should be an edequate supply of these at tactical points within every mine.

There should be laid within all mines a system of pipelines with suitable taps and with hose and nozzle available and properly housed, and these should be supported by an adequate water supply. In fighting mine fires with water, men not protected by artificial breathing apparatus can rarely approach within fighting distance owing to the confined space and the consequent volume of smoke which is not dissipated as with surface fires into the open atmosphere. For these reasons the main pipe should be tapped not over 100 feet apart and the hose and nozzle should be of relatively small size—about 1½-inch hose and half to three-quarter inch cone nozzle, so that one man may handle it. Pressure should not exceed 40 to 50 pounds, and as the entries or rooms in which the fire has to be fought are rarely over ten feet in height, usually less than six feet in height, the angle of trajectory is low and the stream can be thrown but a relatively short distance. It is important to throw the water on a mine fire so as to distribute it rather than apply a large volume. Since the area of fire is usually small, a small volume of water is generally adequate.

Large fires such as have made headway and cannot be approached must be fought by scientific methods by mining engineers skilled in such work. The most useful adjunct in such work is frequent analyses of mine gases, the object being to blanket the fire by keeping fresh air or oxygen away from it and reduce the oxygen content of the surrounding atmosphere to a point which will not sustain ignition. Frequent knowledge of the percentage of oxygen and CO_2; and where inflammable gas is made, knowledge of its character and amount; and knowledge of the ventilating system and how to handle it; and whether it should be handled with or against the fire; the proper places at which to erect fire doors and stopings, and finally skill in approaching a fire believed to have been extinguished; temperature measurements, and gas analyses before admitting air to the place to be examined lest the retained heat break again into open flame—these are essentials in combating mine fires, either in metal or coal mines, underground.

NOTE.—In view of the success of Federal activity in *reducing mine fires* through the educational agency of the Bureau of Mines, might it not be equally proper and worth while for the United States Department of Commerce to organize at this time like work to teach the country how to *prevent fires* in all *surface created property?* —ED.

MR. EVANS: I am sure you will all heartily join me in expressing our indebtedness to these gentlemen who have taken exceedingly valuable time, particularly our honored guest, Mr. Redfield, to help us in this propaganda. I am also sure we are on the trail of a somewhat broader and more effective program to control fire waste for the future. I suggest a motion to adjourn.

MR. MASON: If I could be permitted to ask the Secretary a question? During the summer I made considerable investigation on fire protection of river steamers, and I find the principle of maintaining equipment somewhat different from that advanced, or rather enforced by the underwriters at the National fire protection meeting in Chicago a year ago last May. There was quite a discussion there over the question of testing unlined linen hose, and quite a difference of opinion as to whether it should be tested dry or wet. I found that on these steamers the practice under the Government regulation is to test the hose every week by putting water into it at the fire drills, and I wish to ask whether the Secretary is informed as to the result of that test. It is the only opportunity I have to gain that information.

MR. REDFIELD: I presume the question is as to the durability of the hose?

MR. MASON: Yes.

MR. REDFIELD: Well, I can only answer that in another connection. The belief of the Steamboat Inspection Service is that the durability of the hose depends more on how treated after the test than during the test. That agrees with my experience in the factory, where we require 70 pounds pressure to be put on the hose, but where I myself looked after the hose after the test and hung it up vertically and allowed it to drain immediately afterward. Our experience on vessels shows (speaking now of inland waters and not salt water) that if the hose is properly and immediately dried it is not injuriously affected by the continued use of it in that way; but that leads me to one thing more. This whole subject of the steamboat service is close to me. I am the third generation having to do with that sort of thing. My grandfather had a hard fight in order to use iron and steel in boilers. They insisted on copper. I have in my office an illustration of a passenger line in 1895 in which they left the barge at the stern of the steamboat because it was considered dangerous.

In the Steamboat Inspection Service we are very anxious to learn. We don't think we have reached perfection by a great deal, and if any gentleman here has experience and, as Mr. Mason has raised the question, can give us light, I wish him not to think it would be intrusive if he would write me. How important that is I can show by giving you an illustration that came up this week. If you can criticise it I wish you would. It is in relation to this *Volturno* fire.

Our steamboat inspection rule now requires that live steam shall be carried into the hold of every ship for use for fire extinguishment and it is so carried. This steam from the boilers is brought at full pressure into the hold of every vessel, but that isn't enough. I don't find there is any sufficient means of utilizing it after it is there. But the suggestion is to run ordinary coils of pipe so that the steam pressure will be substantially uniform throughout the entire line, and could be connected with the main steam pipe, and could be put along the tops where crosswise bulkheads run and would be out of the way and not disturbed by the cargo. Those steam pipes would be perforated, let us say, every few inches, the perforations stopped up by fusible metal—fusible at 280 degrees, say. That wouldn't take much space in the hold and by a turn of the hand in the engine room live steam could be discharged at the exact point of heat in very considerable quantities, and the objections that it might get away at times where it wasn't wanted might be met by putting a telltale trap so as to show whether steam is going where it should not.

Speaking of it as a layman who has had some experience in handling pipe work, that seems a simple and inexpensive thing to do, and very efficient in the inception of fires with boilers running at 200 pounds pressure, if you could let steam at that pressure into a hold through jets in this simple way it would be a pretty lusty fire, it strikes me, that would get away with it.

I would welcome any criticism of it either here or in writing, as I want to utilize it in the annual conference of safety engineering which meets next month.

MR. TROTH: Mr. Harry Davis, of the Philadelphia and Suburban Association, was present at the Victor Company's plant when we made two practical tests of steam in an enclosed room. A fire was built of wood and sawdust, and after opening the doors (having filled the room with steam) we found the fires still burning. We changed the pipes and they have since been doing good work. Mr. Davis would be glad to send to Mr. Redfield an explanation of that change.

MR. EVANS: In lumber drykilns steam has been frequently used in pipes with openings controlled by standard automatic sprinkler heads, and I am sure the underwriters have data and will be glad to send it.

MR. PORTER: If the time has come for adjournment I will say it isn't often that a group of men of this type is treated with such an address as we have received from Mr. Redfield this afternoon, and not often that one of the Secretaries of the Cabinet will give up his busy day and come and talk to us as he has on a subject on which he has such a wealth of knowledge; and although the Chairman of this Convention has expressed the appreciation of the Convention and its thanks, I myself would like to express my own appreciation, and I think the gentlemen of the Convention would like to express theirs. I therefore move a vote of thanks to Mr. Redfield for coming here and giving such a splendid address.

Motion seconded by many.

MR. EVANS: I ask for a rising vote.

Rising vote of thanks given.

On motion the meeting adjourned until nine o'clock Friday morning.

FRIDAY MORNING SESSION

October 17th.

Topic 11—"Management"

NOTE.—The preceding topics all dealt almost exclusively with *physical* means to control and prevent fire waste. This topic considers the *moral* as well as physical subject of cleanly and orderly daily living in property and its beneficial influence in abating and controlling fire waste.

The meeting was opened by the Chairman at 9.25.

MR. EVANS: Topic 11—"Management"—comes up this morning under the resolution as announced. The resolution is somewhat long but its purpose was to be definitive so as to call attention to the causes of the abuse. The first paper is by Mr. Walker, an engineer of many years' experience, and an authoritative writer in this field. I am sure he will give you valuable information.

"MANAGEMENT" (HOUSEKEEPING)—I

By Mr. S. G. Walker, Engineer Manufacturers' Mutual Fire Insurance Company, Providence, R. I.

Fires are but the results of nature's well-defined laws operating in an entirely usual way, commonly set in action only by the willful, ignorant, or careless intervention of human agency.

There are those which may be termed the development of natural causes beyond human control, where man's efforts are chiefly mitigative, if at all effective, bearing only on duration or extent of damage. Fires started by lightning, and the rare occurrences where volcanic action causes damage, would come under this head; but, fortunately, they have relatively small bearing on total fire loss. Fires following combinations of circumstances or conditions not readily foreseen sometimes seem to assume an aspect bordering on the providential, but these again form only a small percentage of the total.

Another class which has its inception in a desire to destroy, or lack of strong desire to preserve, property on the part of an owner, in which the ill will of a neighbor is a potent factor, is defined by the term "moral hazard." It is a prolific source of fire loss but of indeterminate ratio to the whole. These must be dealt with like other criminal acts in the community; but well-regulated housekeeping has a distinctly restraining influence as tending to discourage conditions favorable to such acts.

The most important class from a preventable standpoint comprises the uncompromising rebellions against abuse by a servant designed to minister to man's comfort and welfare; but which proves the veriest tyrant when vigilance is abated or restraint slackened, either through misinterpretation of nature's laws or carelessness in their application. Springing from more or less avoidable causes, these are certainly capable of material reduction by organized effort, intelligently and vigorously applied.

Our fire loss per capita of eight to ten times the average in foreign countries may, at first glance, seem to be largely accounted for by our greater proportion of frame buildings and altogether poorer construction from a fire-resistive standpoint. However, as our losses on frame buildings are about two-thirds and on brick one-third of the total, the entire elimination of frame construction would, at best, only reduce our loss about a third; and considering that the number of our fires, in proportion to population, is about five times that of representative European countries, it becomes evident that our relatively high loss must be attributed to other factors than construction. It is significant that reducing our conditions to a parallel with those in foreign countries would eliminate four-fifths of our fire losses and a like percentage of the cost of maintenance of fire departments; and about half of this saving would follow the elimination of our comparative carelessness. Foremost in the fight against hidden enemies of mankind we are woefully lax in the battle against this omnipresent foe, even more readily vanquished. Freely admitting the disgrace, our task becomes that of arousing the people to apply the remedy, which aim is sufficiently laudable to command the most generous expenditure of money and effort.

That the task is not hopeless is evidenced by the splendidly effective stand of the factory mutual insurance companies. Some 78 years ago a group of representative manufacturers, with high ideals as to the care of their properties, organized themselves into a mutual company, primarily for the "prevention of fire loss to its members through promotion of knowledge of safeguards, inspection, and warning against dangerous conditions," and thus sounded the keynote of the present day problem facing our general community. There are many features of this magnificently successful system which may be, directly or indirectly, applied to the fire situation in this country to-day.

The fact that a fire prevented is preferable to the most efficient extinguishment has been constantly and impressively before the members of the mutual companies as directly affecting the cost of their insurance; for in the early days, with no protective equipment which would be recognized as at all adequate to-day, it was largely a matter of good fortune reinforced by good management, or possibly later the reverse, which prevented their factories from burning.

Their success has been in a large measure due to the unfaltering vigilance expressed in the work of their inspectors, supplemented by coöperation of owners, once mutual confidence has been established, and in the long run this attitude on the part of any community is bound to reduce its fire losses. The preventive feature has been developed until to-day they maintain a bureau for handling this and allied work bearing on fire hazard which represents absolutely the last word in this type of organization.

The particular branch of the system which may well be taken as a guide to effective methods for eliminating careless fires in important properties is the inspection corps, at present consisting of 26 regular men and three extras, devoting their entire time to this work. These men are selected for their various qualifications—personal, educational, and practical—peculiarly fitting them for the service desired; and, unless the schedule is deviated from, due to sickness or other causes, they visit in rotation the risks insured at such intervals that each receives four inspections a year. The periodical advisory visits of such trained men can but be of inestimable value to any one interested in keeping fire losses at a minimum, and many with experience have expressed themselves as feeling this service alone to be worth the entire cost of the fire insurance.

The inspections are most thorough, the inspectors investigating and reporting, with minute detail, upon anything having a bearing on fires, their possible origin or probable extinguishment, detecting hazardous conditions, and advising proper correctives to be applied in each case. Many features demanding their attention would have no bearing on the subject of this paper, but it is of interest that the first item on the report blank (see form on page 362) is "Order and Neatness" (or housekeeping), its position being indicative of its relative importance. Right here is the feature of carelessness sought out and corrected; and it frequently takes several years to sufficiently arouse a new member to an appreciation of the prime importance of this as bearing on fire hazards, so that his rating is uniformly satisfactory. With experience, cleanliness comes to be recognized as a comparative rather than an absolute term; and what would be satisfactory in a foundry or blacksmith shop would be decidedly substandard in a silk mill. The inspector has no record of the previous report on the ratable features of a risk, but each is, in the offices, placed for comparison side by side with its contemporaries, thus giving the officers a composite expression of judgment on the character and upkeep of a risk, obtainable in no other way. Weekly meetings are held by the inspectors reporting at the main office where experiences are compared, interesting incidents discussed, and a general review held of the previous week's work, all favorable to dissemination of accumulated knowledge and the development of a valuable *esprit de corps.*

The plants are encouraged to inaugurate systems of self-inspections, the reports being turned in to the management, as frequently as once a week, by various representatives successively, the rotation principle being followed, thus eliminating the personal equation to the greatest possible degree and equalizing the efficiency of the work. These also cover the important features of housekeeping, but naturally with less detail, and they are commonly held for examination and comment by the following insurance representative.

The annual cost of the inspection bureau to the nineteen companies which share in its maintenance amounts to 13 cents per $1000 insurance. It constitutes 28 per cent. of gross operating expenses, equals about 54 per cent. of the fire losses, and represents 14 per cent. of the net cost of insurance. These figures include other functions than the regular inspection work above described, such as special engineering in connection with fire protection, valuations, adjustments, laboratory experimental work, and the development of plans showing details of insurance interest at the various plants. The regular inspections alone use up about 6 cents per $1000, but this would be misleading as a measure of possible cost for a municipal department, as it involves about 50 miles of travel per inspection.

Anything approaching such an elaborate or efficient system is, of course, out of the question except in congested sections of large cities where the danger of a fire spreading is imminent, and crowded tenements or large plants, with heavy concentrations of value, render organized effort feasible; but where these conditions exist a system of periodical inspections by an adequate organization is about the only ultimate curb for careless fire loss, and any city of more than fairly moderate size would be well warranted in undertaking the development of such an organization commensurate with the demands of the situation. This should be absolutely independent of politics, perhaps under the general direction of a representative board of prominent citizens vested with mandatory powers to inflict penalties for flagrant violations of ordinances and established rules. In smaller communities, consisting largely of isolated dwellings and commercial or industrial properties of relatively small individual value, thus contributing comparatively little to the aggregate fire losses of the country, the police force or fire department might, without burdensome expense, be made to serve as a basis for an inspection system.

However elaborate the organization, it might profitably extend its field of activity beyond the uncovering of conditions which lead to fire loss, and bring its accumulated experiences to bear upon the reporting of fires and investigation of their causes, thus aiding the discovery and punishment of incendiarism and arson. In all communities, this active work might well be supplemented by an educational campaign, carried on largely through the public schools, in which care in the use of matches and of fire for domestic purposes, the handling of hazardous liquids, removal of ashes, disposal of combustible refuse, and other patent topics, might be impressed upon the young at a period when habits are easily formed. This would tend to bring such matters before the home circle for discussion, eventually making the community at large more attentive to safeguarding property, and arousing owners to a proper appreciation of the fact that fire loss as a tax is more nearly capable of direct control by the taxed than any other. Such educational work is already under way in some localities, but it must be made general in its application to be broadly effective.

Although concerted action is desirable as an eventuality, the individual operation of such a system, in any city, is bound to bear fruit, through reduction in fire loss far exceeding the cost of maintenance. No accurate advance estimate can be made of these results, but aside from the influence on the *morale* of the community there would be a direct financial reward in the reduction of insurance rates, the public at large, in the end, standing back of the insurance companies to foot the bills.

It is perhaps beyond the scope of this paper to attempt an elaboration of a suitable inspection report in all its details, but it should be in such form as to emphasize conditions, with reference to comparative cleanliness, prompt removal of combustible waste materials, restriction of smoking, proscription of kinds and regulation of use of matches, care of private apparatus to insure its being in operating condition, and the establishment of fire drills to protect the lives of employees.

Many foreign countries take immediate steps, following a fire, to fix the responsibility as to the cause, and, the culprit once discovered, an adequate penalty is administered; while it is frequently made a condition of recovery under an insurance policy that an owner must first prove himself free of responsibility for the fire, all tending to make the individual more careful of his own property and that of others. In this country no penalty ordinarily attaches to careless practices which may cause fire, and the careful man is called upon, without adequate redress, to pay for the mistakes of his neighbors. Quite likely such drastic measures as are common abroad would not be countenanced with us, on account of deeply seated ideas of personal freedom, but it is certain that well defined and persistent effort could at least fix the blame and lead to more satisfactory conditions.

The results of high-grade housekeeping in commercial or industrial properties do not stop with the avoidance of fire losses and attendant benefits, but there is a contingent benefit in the increased efficiency of the help, for operatives will work more cheerfully under cleanly conditions. Improved health permits of greater efficiency not only in the actual bulk of output but in the character of product or service rendered. Instances are common in which this very feature of comparative cleanliness has established superiority of a concern over all competitors, and the grade of housekeeping may even serve as a measure of prosperity. Attention to details, symbolic of good management, will countenance no slack methods in any department.

Superior construction and protection may act to prevent the spread of fire in the same way as an efficient doctor cures the established ills of his patients. We live in an age of prevention; the trend of modern medicine and surgery is rather toward avoidance of disease than its cure. The merchant takes frequent account of stock to insure his commercial welfare. The manufacturer scans his inventory to forestall dangerous symptoms, and this principle, so effective in all things human, will not fail in its application to fire loss.

MR. EVANS: We have a very wide analysis of the subject of "management" in our papers this morning from those who are peculiarly expert in its practices. I now want to bring out another viewpoint—that of the active fire-fighting force—from a man who has for years consistently believed that sound "management" control exercised through active firemen is the best way of abating fire waste in cities. This is by Ex-Chief Loller, of the Youngstown (Ohio) fire department, who for the past ten years has regularly applied firemen's inspections there and materially reduced fire waste thereby. Mr. Loller was for several years president of the International Fire Engineers (comprised of the Chiefs of Fire Departments), and I believe he has one of the best experiences in the country in this sort of work. In his absence I will read his brief paper.

"MANAGEMENT"—II

By Mr. W. H. Loller, Youngstown, Ohio

"Management" seems to me to solve part of the question of fire waste; but I presume that its enforcement is just as important as the principle itself. It is very essential, to my mind, that the word "law" be inserted—"Management Enforced by Law." But with whom will you vest that power? Experience in actual service has taught the lesson that to vest that power in a position controlled by political influences is wrong and dangerous. It places the man under obligations to the appointive power, and deprives him of the privilege of selecting his deputies according to their merits and ability.

Fire waste in the United States can be traced to a lack of proper building laws properly enforced, and mismanagement. Enactment of the laws should be by a judicial assembly that has more than a political and personal interest. Laws should be enacted by a body that has had experience and knowledge in construction and that has a heart interest in those who are exposed to personal danger and financial loss. There is no question to my mind but that the bulk of the fire waste of this country can be charged directly to carelessness, lack of management, and failure to enforce what laws we have. Fully 75 per cent. is avoidable.

The common "parlor," or "snap," match is more dangerous than any known explosive. More lives are lost and more property destroyed from this source than from any other. Fully 55 per cent. of the "unknown causes" are from this source. Smoking is another common cause of fire which has a large percentage of waste to its credit. This is especially true in sections peopled by foreign-born people. The careless storage of rubbish and ashes must also be counted in. Then, of course, there is arson, and no law can be too severe for this class. We must not overlook the electrical end either, as it comes when and where least expected. This latter can be charged to building laws and inspections. Inspections should be made by firemen who have had experience in fighting fires. Such men are better qualified to carry on these inspections because of their knowledge of fighting fires and because they can recognize the hazard at a glance. They act on experience and not theories.

The management of a home or dwelling should not by any means be overlooked. The idleness of the heating apparatus during the summer months is a fire-breeder. The careless sweeping of floors where there are registers often paves the way for loss of life and property.

Inspections should be made as often as the corps in charge can make them, and a complete record of each inspection should be kept.

While not exactly along the line of this particular subject, another phase of conditions in foreign quarters which affect public health as well as create fire hazards should be considered. Based on reliable statistics, there is a startling amount of sickness and immorality as well as fire dangers bred in districts of this sort. In a measure this arises from ignorance as much as anything else, and the proper sort of education will help in the work of elimination. Dangerous smoking, careless storage of rubbish and ashes and crowded sleeping quarters should all be made the subject of investigation by both fire and police powers, for both departments of public welfare are intensely interested in a solution of the problems presented.

The conditions of all cities are not the same, making it impossible to have one system for all. Some use soft coal. There are certain conditions existing in such cities different from where anthracite is used. For instance, there is the collection of soot in chimneys, and the chimneys burn out once a month if not properly cared for. The faulty construction of such chimneys often leads to fires. Shingle roofs should be prohibited for they are great fire-breeders. Nothing but fire-resistant roofs should be permitted in business districts. Tar roofs are no better than shingles. The chimneys and flues are among the most important parts of a building, and apparently they are given the least attention. Storage warehouses, large or small, should not be overlooked. As a rule they will receive almost anything without inspection. About the most important thing to the owners of such places is the monthly rental received.

One of the most dangerous fire hazards about the dwelling is the closet used for the storing of summer or winter goods. Here is where the match plays an important part when the user strikes one in looking for something needed in a hurry.

Management, to my mind, resolves itself into an absolute education to prevent the fire waste of this country and it has been greatly neglected. We need more men to "take the bull by the horns" in all our cities, as Mr. Evans and his aides have done in this beautiful city. You would soon be decreasing the fire waste by the millions. How commence this education? I would suggest beginning in the schools. Train the young minds in the necessity of preventing fires and educate the boys along this line as you would along any other. A single demonstration at the schools or the fire-engine rooms would make a lasting impression. We must look to the coming generations to carry on the work of fire prevention.

Again, if the business men of this country would devote 30 minutes each week to the study of fire prevention, in less than a year they would do more to prevent waste than ten years of legislation. It rests with the business interests to take the initiative by taking the question up with their employees.

MR. EVANS: In discussing Public Fire Protection (Topic 6), reference was made to certain remarks by the Hon. Herman L. Ekern, Insurance Commissioner of Wisconsin, before the City Club of Chicago, on "Fire Prevention Day," October 9th. His views covered that subject and the present one, and hence were held for use here and are now laid before you:

"FIRE PREVENTION"

By Hon. Herman L. Ekern

I want to congratulate you and the city of Chicago on entering upon this fire prevention work with a man who takes the heartfelt interest in the work that Fire Chief McDonnell does.

I will not tell you that this work is not needed in the city of Chicago or that you can "sit back" merely because you have entered upon it to the extent that you have. You don't compare well with cities in the Old World—none of the cities in this country do—and the excuses that have been given for the failures of our cities are not sound.

They may be satisfying, but a little study of the subject of fire prevention will convince any reasonable man that our cities, like Topsy, "grow" in this subject without any attention.

It happens just at this time, as you probably have noted from the daily press, that the city of Chicago shows a loss for the first nine months of this year of four and a third millions of dollars as against three and a third millions of dollars for the same nine months during the preceding year.

There is a net increase of a million dollars in losses. Your average annual losses are approximately five million dollars. With the ordinary list of fires during the coming few months your losses this year may well amount to nearly six million dollars. As compared with the city of Berlin with perhaps a fire loss of a quarter of a million dollars, this seems like a scandalous waste.

It has been the custom to excuse this great waste because of the difference of construction. That excuse does not hold. If you would put Berlin people in this city instead of its people you wouldn't have any such fire loss as you have to-day. If you were to raze this city to-day and preserve its people, they would rebuild it; but unless their methods of thought changed on this subject, the fire loss would not be greatly changed. We have felt that in this new country of ours the development of our cities has been unparalleled. That may be true of some cities which have grown from nothing into large cities during a decade, or two or three decades; but take some of our large cities which were established more than thirty years ago and compare those with progressive cities of Germany and the comparison is not to our advantage.

The city of Buffalo in a thirty-year period increased 173 per cent., the city of Colon 253 per cent., the city of New Orleans 57 per cent., the city of Dresden 248 per cent., Louisville 81 per cent., Hanover 146 per cent.

Now take the later ten-year period, and look across the lake to Detroit, a city which is pointed out as having made the greatest progress in this country. Its gain was only 63 per cent., while Düseldorf gained 67 per cent.

Those foreign cities have to meet the problem of rapid growth the same as ours. The fact of the matter is, the number of fires in our cities is not due in any sense to defects in construction in a majority of cases. Any fire marshal, any engineer who has studied the problem, will tell you that the great mass of our fires is due to temporary or transient causes, coming from the occupancy and the method of housekeeping. No construction corrective will wholly remedy those fires.

Now clear another cobweb. It has been charged through the newspapers of this country that the great mass of fires is due to criminal acts and that the firebug is responsible for the great mass of our losses. I think such charges are an insult to the intelligence of the American people. The best statistics that can be obtained show that perhaps not to exceed five per cent. of the losses are due to criminal acts, to direct arson. Take your own observation and note the fires that occur through this city, or through any city you are acquainted with; and while there are a large number for which causes cannot be assigned there is no legitimate excuse for charging any large proportion of them to criminal arson.

Besides, arson appears sporadically, and while it is a difficult crime for conviction it is generally corrected by the public authorities. The mass of the fire waste is not due to criminal acts but to moral carelessness—which the public should condemn almost equally with a criminal act.

Suppose that one individual controlled half of the personal property of this nation, and suppose that individual threatened, by his direct act, to destroy that property; or, by his negligence, to permit its destruction; how long would the people of this country face that threat without taking steps to remedy it? And yet it is that deliberate (perhaps unintentional) carelessness or neglect of conditions which produce fires which are responsible for the great mass of the fire waste to-day.

Read the reports of our State fire marshals and you will find that anywhere from 40 to 80 per cent. of our fires are due to these temporary conditions, this carelessness, and that these conditions in the great majority of cases are easily removable.

There is only one conclusion that follows: Remove half of the causes of fires and you stop half of the fires. We are not asking that conditions in this country or results in this country shall be brought to the point to which they have been brought in the countries in Europe; but it is a very reasonable request, upon the statistics available, that the fire losses in this country shall be reduced by half within the short period of five years.

What do these losses cost you? I said the losses in Chicago were five million dollars each year. They are increasing. *To distribute the indemnity* for those five million dollars of losses—and those are insurance losses, I don't count the incidental losses—you pay an annual fire premium of double the amount, or over ten million dollars. *To protect your property against the spread of these fires and against the danger of conflagration* you spend another three and a third million dollars. There is a tax in this city to-day of well upward of twenty millions of dollars for the visible losses from fires, not to speak of the great losses from interruption to business and the loss of life and limb every year. Wipe out half of the losses, and you can almost wipe out half the cost of this great waste.

What is the remedy? I have no sympathy with a mere doctrine of idealism which aims at a goal very laudable, but which does not provide some way to attain that goal and is not willing to modestly take the first step to that end. I congratulate the city of Chicago on having begun that step, but I want to tell you that you haven't gone very far.

During the last two and a half years we conducted an investigation into the business of fire insurance in the State of Wisconsin by a committee of the State legislature. Right there I want to digress one moment. I don't know how many of you have ever served in the State legislature. In a good many places it is talked about in the same class as service in jail. Where that feeling prevails you get just the kind of service from your legislature that you would get if you turned their work over to the occupants of the jails. Your public officials will do the kind of work that you expect of them; and if you want good government you must look to your public men to give it to you and not be eternally holding them up as cutthroats, burglars or something worse. Why did we have a legislative committee and not a commission? For this reason: Experience there has taught us that while members of the legislature may not bring to the solution of problems the expert knowledge and all the education and training which you would like to have in considering these problems, they do bring a practical knowledge of political conditions and a pracical knowledge of how much the legislature will stand for enacting into law, and how much the people will stand for after it is enacted into law; and then the members of the legislature, appointed on such committees, are reëlected and go back into the legislature and apply that knowledge in a practical way; and through their service on the committees in the succeeding legislatures enact into law the recommendations of the commission in a practical way, which generally remains on the statute books and becomes a living force in the daily life of the community.

Against that, the recommendations of your expert commissions, quite generally, are printed in numerous extensive volumes and are put on the shelf and forgotten.

I served several years in the legislature and I am sure that the conditions are not a bit different in the great State of Illinois than they are in our small neighboring State of Wisconsin; and besides, our legislative committees in Wisconsin quite generally hire expert service that you perhaps never get to serve on your commission; and they avail themselves of volunteer committees just like the volunteer committees that ou are using in the City Club.

We had such an investigation into the business of insurance. We ound early in that investigation that the problem of fire insurance was onnected directly with the problem of reducing fire losses—not that the eduction of fire losses is the whole problem, but it is a very large part f the problem—and when we began to study the reduction of fire losses ve found that the improvement in conditions with regard to buildings nd structural conditions would be a matter of very slow growth. We vere startled to find, as I have indicated, that it did not promise any reat amount of reduction in our fire losses.

We were confronted with this one problem of how to bring home o the people of the State of Wisconsin the fact that fires are principally aused by easily recognizable conditions which can be diagnosed with just s much certainty as the physician diagnoses the disease of his patient, nd that these conditions may be removed with just as great a certainty!

In facing that problem there was but one conclusion, viz:—the emedy consisted largely in the education of the public. You can ducate the pupil in the public schools because you compel him to go to he schools. You can't educate the adult in the same way. You have ot to bring the school to him. We found that the insurance companies vere already going through every building (dwelling houses excepted) n the State of Wisconsin, from garret to cellar—for what purpose? *or the purpose of determining the rate which they should charge for he different conditions which caused fires!* We then asked the simple uestion: "Why can't the knowledge of those conditions be used for he purpose of securing their removal?" and as a result the committee ecommended, and the legislature enacted into law, a provision that, rom the enactment of the law, every property in the State of Wisconsin vithin the fire protection limits should be inspected once in three months nd a written report made of that inspection.

The inspection is required to be made through the chiefs of the fire epartments, under the direction and control of the State fire marshal. ou might have thought that that would have aroused big opposition n the ground of expense, but, remarkable to state, the chiefs of the fire departments generally supported the recommendation and they haven't asked for any great additions to their force on account of the law.

The chiefs of the fire departments generally take the position that it would give them better control over their men and that it would be of the greatest possible value in fighting fires because of the knowledge their men would have of the conditions.

We have a very simple way of enforcing that rule upon the different cities in our State. Our cities have a 2 per cent. fire department tax from the insurance companies. It is paid through the State. If the inspections are not made to the satisfaction of our State fire marshal those funds are withheld from the fire department, and the consequence is that every fire department in the State of Wisconsin is now engaged in making those inspections. There has been a convention of fire department chiefs, a form of report has been agreed upon, and there is perfect coöperation between the fire chiefs and the State fire marshal. That is one of the fortunate things about your work, as you have entered upon it, namely—that by doing it in connection with the fire department there will be no friction such as has been experienced in the city of New York.

I have discussed this subject from this point of view because, no matter how beneficial your work may be found in the city of Chicago, you may find yourself facing this problem: that through some political upheaval or through some pique of some person seeking personal advantage an attempt will be made to wipe out the good work that you have entered upon. Go to Springfield and ask your legislature to make it mandatory upon the cities of the State to provide this kind of inspection for the whole State, and you will have it established so that no political upheaval and no administration can every wipe it out.

The problem is not an isolated one for any individual city. It links up with every other city. If the losses outside of Chicago are excessive you help pay them; if inside of Chicago they are excessive, others outside of Chicago help you pay them.

There is one more thought that I want to leave with you, viz: that in our city government we have been, and still are, almost hopelessly inefficient. The feeling that politics is too dirty to touch has been the great obstacle that has stood in the way of better city government. We are correct in that; but in correcting it, and in arousing public opinion to the correction of it, we need to understand that it is in the interest of the citizen to see that he has good city government.

This question of fire prevention connects with your fire rating. If this inspection work can be connected up in such a way that every owner of property will know that when he improves his property and removes the fire hazards he will get a benefit in his fire rates, there will be a direct incentive to the citizens to make those improvements.

This is the attempt of the fire insurance companies to-day, and they should be given credit for it, and be given support in their attempts to apply scientific schedules to making their rates.

I know there is a cry on the part of the average American citizen for liberty of action, a demand that he shall have all the benefits of competition, and especially large property owners are prone to insist that any law which limits their right to buy their insurance at any price they please is an infringement upon their liberties; but if you carry that thought to its logical conclusion it only means that the large property owner, through his activity or through favoritism, is able to secure, without the improvement of his business, reductions in rates which should only be granted because the hazard has been bettered.

I want to plead for support for a system of rate making in connection with fire prevention which will fairly and equitably distribute pon all property owners their proper proportion of the actual fire loss, ith a reasonable and most economical charge for the transaction of the usiness.

MR. EVANS: We have with us this morning a gentleman who is o a large extent cleaning up the State in which he resides. He is so good at the work that not even the Democrats dare turn him out, though e is a Republican. I take pleasure in asking Colonel Lewis T. Bryant, Commissioner of the Department of Labor, Trenton, New Jersey, to ddress you now.

COLONEL BRYANT: I don't think there can be any argument about he necessity of good "management" to abate fire waste. The problem hich has always interested the Department of Labor in New Jersey n fire prevention and protection matters is how to obtain this good anagement. We have operated on the principle that the job which is verybody's job is attended to by no one. We have endeavored to nalyze the situation and so far as possible to bring down the methods o well described by the first speaker and demonstrated by the insurance ompanies to the factories in general. It has been our experience that he management of factories is more concerned in the balance sheet, and eeping the business force busy with the finances of the factory. We ave the same problem in the matter of protection of machinery—elimination of industrial dust, etc. Many of the managers, the proprietors, arely visit the actual works. They go into the office and remain there; nd if they do go through the works they pass machinery that has been angerous for years and it is not called to their attention. Or, they may ave a dangerous fire hazard there and have seen it for years, yet pay no ttention to it.

We have in our State the Factory Fire Chiefs. We made an appeal o the manufacturers to designate one of their high-class employees to ct as fire chief. We have expanded it to include not only fire protection and prevention, but to have general supervision over matters of leanliness, sanitation, and the general supervision over such matters s electrical systems of alarm, blower systems (where required), and f all matters of factory hygiene. This is, as you know, a decided nnovation and we don't know how it will be received.

I spoke constantly to the manufacturers about protecting their property—showing that it was vitally important to them that ordinary prevention measures should be followed up, and generally that good housekeeping should be carried on in their factories. The plan of the department is to hold occasional meetings of these factory chiefs and have illustrated talks, and give elementary instructions covering the safeguarding of the lives of fellow employees and the property of the manufacturers.

We appealed to the factory manager by showing him the responsibility of his position. The first meeting we held was purely in the form of an experiment. We thought 150 to 200 representatives would abundantly repay us. At the first meeting we had over 800 men, and upon making an analysis found twenty different cities represented. We had received actual appointments of between 300 and 400 factory chiefs. To-day we have appointed in the State of New Jersey over 1000 factory chiefs, representing over 1000 factories, coöperating with the Department of Labor in trying to prevent fires and also for factory discipline. We held a meeting on September 8th and had something over 2000 people. The entire lower floor of a huge meeting place filled with these men, present for the purpose of ascertaining the best methods of handling this factory situation, was one of the most inspiring sights you could imagine.

The department has prepared for the use of these men books of instruction with the rules and regulations for conducting fire drills and organizing fire brigades. It has tried to anticipate conditions of fire hazard and endeavor to fix the responsibility on each person who will take part in this propaganda. We divide the building up into fire stations. Whether there are 3000 or 4000 operatives, or only 25 operatives, we believe that if there is a fire hose, or fire axe, or extinguisher in a building it is somebody's duty to know how to use them. We have issued little cards "In Fire Station—so and so," designating men for the use of each of these pieces of apparatus. We have a card printed and sent to factory chiefs stating "This piece of apparatus was put in commission on such a date; fire hose tested on such a date," etc. We provide for the actual conditions that would exist in case of fire or panic.

In our State we have a law which says that in all factories more than two stories high there should be an electric fire alarm system, also fire drills. We define the specifications for the alarm. If a fire occurs on any floor the signal will sound throughout the building, showing the floor on which the fire occurs. In one factory they have 25 extinguishers, but you can ring from the top floor and in less than a minute can have 25 extinguishers up there ready for action, also hose and complete fire equipment. The fire drill is outlined in the same way. There is a person to go to dressing and toilet rooms to warn employees.

There is also a law in our State providing that fire doors shall open out on fire escapes (see cuts page 80). Men are told off to see that e windows on fire escapes are closed; and a fusible link is also used to ose them automatically. A man stands at each of the different exits the building to see that the female operatives leave in an orderly man- r. The duties of factory chiefs are outlined in our book of instructions.

We wish to have drills conducted with serious intention and done in spirit of coöperation. If done in a perfunctory manner they lose their lue. We issue a badge paid for by the State—rather an attractive dge, bearing the emblem of the State upon it and issued to factory iefs, with autograph; and it is surprising what pride these men show wearing an emblem of this kind.

It is not good to depend too much on the local organization and t enough on the paid fire department. In a great many places they pend too much on their own department and when the paid depart- nt gets there the fire is beyond control. I believe that without excep- n we have coöperated with the local fire departments throughout the ate. It is a part of our control. Ordinarily, if a fire occurred on the h story of a building, it would be necessary to run down five flights of irs, go to the telephone booth, hunt up the number of the fire depart- nt, get Central, and then turn in an alarm; and many minutes were t. In our scheme, if a fire occurs on the fifth floor the alarm is rung. the office of the plant is a small bell, a "trouble" bell; and when the paratus sounds the code, they know immediately that there is a fire. is the duty of some one person to send the alarm to the fire depart- nt by an auxiliary box or telephone in each factory in the city. You the time saved? Simultaneously with the discovery of the fire on fifth floor of the building the alarm rings in the office and the alarm then transmitted to the city department, which brings the local fire gade at the same time to put out the fire. We have had the system operation nearly two years and up to date it has not failed at a single . The only trouble we had was in the beginning, before fully organized, ien they used the local box and didn't send for the city department mediately. But we think we have that obviated now. With a great ny of our systems they are connected together. With the Campbell tem, or the American District Telegraph system, the alarm is sent oughout the building and at the same time to the nearest fire depart- nt and nearest salvage corps. It is done automatically, being all on same system.

Not so long ago I was going through a factory in our State using system in such a manner. It is one of the highest class factories where. It was a high-class confectionery place, and you could eat the floor, as far as cleanliness was concerned. The superintendent l a system of electric alarms and was averse to putting in a fire drill. great many of the employees work on chocolates, and he thought he would lose thirty to forty dollars' worth of chocolates at every drill, but I showed him the need of the fire drill to protect his property. I asked, "Have you a factory chief"? "No," he replied.

After he left (I had an inspector with me) I said, "We will go down into the cellar." If they had deliberately tried to burn down that building they couldn't have succeeded better. They had one stairway and under that they had placed all the old boxes and barrels and junk of that character, and several cans had been filled with varnish. Crates for candy were piled from the floor to the rafters. The wiring was exposed. They had an elevator in operation throwing out a decided spark every time it went up or down. There was no guaranty that there wouldn't be someone there smoking. I didn't have a very friendly feeling for the man anyhow, because of the way he had acted; and when I got back to my office I called him up and asked: "Who told you a factory chief was unnecessary? When were you in your cellar last?" He said, "Not for a long while." I said, "You just go down there," and I told him what I had found, and continued: "If you had deliberately tried to burn down that building you couldn't do better!" They have since had a fire drill, and the cellar is clean. The girls go down through the fire tower and bring the chocolates with them.

We have tried to control the matter of smoking. One of the factory chiefs was elated because they had broken up the habit of smoking. Men will be discharged if found smoking in that shop. We have issued many cards saying "No Smoking on the Premises," and where it bears the authority of the State it has a great deal of weight with the men. The same with the "no spitting" cards. Is it not always worth while to have someone whose business it is to see that this "good housekeeping" is maintained, and to be on the job all the time?

MR. EVANS: You have now had four points of view of "management"—that of the mutual underwriters through Mr. Walker; that of the actual fire-fighting force in Mr. Loller's paper; that of the State official primarily charged with control of insurance matters in Mr. Ekern's remarks; and that of the State official charged with the administration of the general factory hazard (including the fire hazard) in Colonel Bryant's remarks. The last speaker has made it very clear, to my mind at least, that the theory of combining in one efficient man the range of reasonable inspections—the combination under him as head, and his inspectors, of all the services of inspections in one building—is the real high road to economical wide-reaching control of all these nuisances whether of fire or health. It is very curious how many interests will support a somewhat wider propaganda than merely caring for the fire risks. The man who is interested in social work or sanitary reform will coöperate with you.

I have been handed this morning an ordinance recently passed by the council of Omaha, Nebraska, which controls fire hazard in stables; and that ordinance was prepared and brought before the council not by fire prevention people but by the National Humane Society—to save the useless destruction of animals by fire, especially horses. The ordinance is as follows:

> SECTION 1. Each barn in the city of Omaha, used for keeping or housing horses, in which five or more horses are kept, shall have not less than two exits, suitable for removing horses from the barn, leading from that portion of the building in which the horses are kept.
>
> SECTION 2. The proprietors of each barn in the city of Omaha in which five or more horses are housed or kept shall either keep a watchman in such barn at all times when the barn is closed, or in event a watchman is not so kept then the proprietor shall furnish the chief of police with a key to each door of the barn, which keys shall be kept at the nearest police call box for use in event of fire or accident.
>
> SECTION 3. No person shall smoke, or carry a lighted pipe, cigar or cigarette in any portion of a barn in which five or more horses are kept except in the office thereof.
>
> SECTION 4. Any person, firm or corporation violating any of the provisions of this ordinance shall on conviction thereof be fined in any sum not less than five (5) dollars nor more than one hundred (100) dollars.

There is a tremendous range of interest and influence all over this country if we merely draw these into accord and bring to these different activities some intelligent knowledge of what we are striving for, and learn from them what they are striving for. There is plenty of work being done and plenty of power, but the team don't pull together so far. This thought furnishes one of the reasons for getting up this meeting.

Remarks are now in order on the subject of Management. As you may have observed, the Chairman has taken advantage of his privilege to get in his remarks first.

MR. CHARLES B. WHYLER (Cleveland): On the subject of animal losses, prior to the first of January of this year very little attention was paid to the frequent burning up of horses. At the beginning of the year I looked over our records and went back for five years, and discovered that no less than 75 horses, and as high as 120 horses, had been destroyed by fire during each of those years. Having great feeling for the horse I sent my inspectors out with strict instructions. I noticed that the destruction of horses generally took place between November 15th and April 15th. That, I thought, was when the horse was least needed by the owner. I told my inspectors to go to each barn where a horse was kept, to look around thoroughly, and to do so until he attracted the attention of the occupant of the place. Generally someone came out and asked what he was doing. Then he was to strike from the shoulder and tell them that the burning of horses was too frequent and we were trying to decrease that this year. Generally it was carelessness with a candle, or cigarette, or match, and sometimes the cause was unknown, which in my estimation was far-reaching. With that method during the year of 1913 we have had less than 10 horses burned in the city of Cleveland, because occupants were told that if the horse was burned without good reason the owner would be held responsible, also the firemen in that district.

MR. R. H. MORRIS (Philadelphia): You asked me to prepare a paper on this subject, which I carefully and quietly unloaded on Mr. Walker; but I would like to say a word because this is one of the most important subjects before this Convention. Safety from fire resolves itself into *fire prevention* and *fire protection*. Of course, the question of housekeeping—order, management, etc.—comes under fire prevention; and I think that the most important feature of this work for the reason that it is the basic cause of a majority of all fires that occur. I could give illustrations without number. A match or cigarette dropped through a grating on the street would be of very little danger if it were not for the rubbish usually accumulated there. Matches, cigarettes, cigars, etc. (which cause a vast number of fires), are especially dangerous and in need of control, it seems to me, because they can be carried into almost every building or piece of property. *Fire protection* can be counted upon to take care of all buildings which are so equipped, even from fire occasioned by lack of neatness; but many buildings cannot have good means of putting out fires, and their *housekeeping* should be depended upon extensively in the matter of prevention.

The Secretary of the Department of Labor yesterday laid stress upon the necessity of getting our message in plain, simple language in order to carry it to the men we are trying to convert to methods of safety; and it seems to me this question of order and neatness can be explained in simple language even to a child. It is the phase of the inspection service which is important. It is important for an inspector to find accumulations of rubbish, etc., but it seems to me his field of usefulness can be far more extended if he can go as a missionary—to take the time to explain in simple language in the warehouse or department store, and preach the gospel of good housekeeping. We can reach the larger property owner through his pocketbook, I think. One or two illustrations from my own experience may be of interest. Some years ago I endeavored to influence large manufacturers in Pennsylvania to have their places cleaned up. In one place I dug down and picked up a dozen spools of silk. I went to the owner and showed them to him. He asked: "Where did you get those?" I said, "In a pile of rubbish." He expressed himself forcibly and took them with him when he went back.

Soon that mill was one of the cleanest in Pennsylvania. It touched his pocketbook! I have used that illustration in several other mills and I have found it a very valuable argument.

Mr. Walker referred to another feature in saying that profitable business and good housekeeping went hand in hand. That is my experience in Philadelphia. After many years of successful management, good housekeeping in one of the textile mills here went down hill; and I believe that was one of the first things that led to the final failure of that one-time successful manufacturer.

Mr. Forster: It is pretty difficult to present a new thought on a subject on which we are so well agreed, and which has already been covered from so many points of view. I would like to suggest that the fighters in the fire prevention movement adopt a new beatitude: "Blessed be cleanliness." Lack of cleanliness is responsible for many fires—from spontaneous combustion, from combustible materials near gas jets, etc. If it had not been for lack of cleanliness we would have had no fear of the cigarette stump burning the Triangle building; and many other disasters not so well known could not have been charged against our nation if it had not been for lack of cleanliness. No parts of cigarette butts or even parlor matches could start a fire on a smooth marble surface, but they are dangerous down stairs or through a hole in the sidewalk. Many property owners have thought that it is cheaper to clean up once in a while than to keep "everlastingly at it." One place spent $14 for labor in cleaning up every Saturday; whereas a first-class man could have done that for $12 per week. When that was known a cleaner was given the job. We have to keep after the men *at the head of the proposition.* I have in mind one place employing 7000 men. After visiting that building many times we made a night inspection and accumulated a bushel of clean and partly-dirty waste. That kind of spirit at the head will go right on down the line to the last foreigner having to do with cleaning up. It is not only necessary to have a fire chief, as Colonel Bryant said, but to see that he is actually on the job.

One more word, calling attention to the inspection blank which our firemen are using in Philadelphia. When that was brought up for discussion in our meeting we thought we would cover the whole gamut of emotions. But we finally decided to cover principally the essential features:—first, accessibility—how to get into the building if it was burning; and second, cleanliness in the buildings and yards; and the record we are bound to make in Philadelphia as the result of our fire prevention efforts will be primarily based on the fact that our houses and yards and cupboards and lockers will be cleaned up. "Blessed be cleanliness!"

MR. FRANK B. RUTHERFORD (Philadelphia): Just a few words in regard to the horses. We are looking after the welfare of our four-footed friends in Philadelphia. Each year our officers make an inspection of stables, especially where horses are above and below the grade floors. In many instances there are not sufficient runways, and at night they are blocked by wagons. I have been asked if some stringent regulation couldn't be enforced to provide additional exits where horses are kept above or below the grade floors.

MR. HEATON (Toronto): I would like to bring a message from an association of men who have always had an intimate relation with our insurance friends forming the backbone of the fire prevention cause. There is a spirit of coöperation of the manufacturers and those who are striving for fire prevention matters. Last month we held a convention in the city of Halifax, by our Canadian Manufacturers' Association, and one of the best in the history of this association. One of our departments made a report on conditions affecting the record and experience in the northern part of this continent, and it did credit to the department and to the association, but created somewhat of consternation among the members of the association. The result was that, at the close of the convention, the committee on resolutions (of which I knew nothing) brought in a very strong resolution on the subject—first of all, of our Canadian fire waste, and, second, enforcing on the members of the association the necessity of caring for it, chiefly by attention to those elemental truths of care and carelessness on which so much discussion has occurred this morning. These views will not only be printed in our record, but we have had printed separately many thousands, and a copy of this resolution will go to every member of the association, and abroad to others.

Manufacturers realized that while they are apt to overlook a few of these causes they do throw light on the fundamentals of insurance, and it is only by hammering home things of this kind that they will ultimately triumph in the way we desire. As I said yesterday, in the north we are apt to be a little slow—it may be because of climatic conditions or other things—but the association I represent, comprising 90 per cent. of the manufacturing interests of Canada, is taking issue with this tremendous evil.

MR. EVANS: I would like to call your attention to one thought that has come up here in a number of connections, and that is the necessity in all these things, small and large, of having *some continuing organization.* It does not matter much what the effort is, but it must be *somebody's real business, not a transient fad.* It may be cleaning up the shop (which ought to be done a little each day as a business instead of once a week or month or never); or it may be that the fire-fighting force which is only voluntary (measurably useful, admirable in spirit, but lacking in strength when the test comes); or it may be a matter of some volunteer commission or transient agency in the city or State. We will never get control of a *continuing evil* unless we make a *continual fight against it;* and the only continual fight that works is the businesslike fight.

We never really got started to move in this community through our Fire Prevention Commission, after six months of charming lunches and discussions once a week, until after we had a competent engineering manager with stenographer and clerk to clamp down on the details every day and ten hours per day. Then we accomplished something. If we can get it advertised that this fire waste affair is important enough to command attention, and have the fight against it definitely organized, we will have done a lot to control the whole difficulty. Are there any further remarks on this subject?

MR. GODDARD: The remarks you have just made lead me to say something which I thought at first wouldn't warrant the time of the Convention, but I want to emphasize one of the points you have just brought before us.

A great many years ago there was a man by the name of Noah, who was confronted not with the fire danger but with the water danger; and the work was assigned to him to save property and lives; and we are told that the animals went into the ark two by two. We are not told that there was any discussion as to whether the elephant or the smaller animals were the more important to be saved. I don't believe that question was to be considered. I believe they took it upon themselves by definite steps, two by two, to go into that ark, and they all got in, and in the end they were all saved.

A great many years after that we were confronted with another water problem. The East River was an inconvenient barrier between New York and Brooklyn, and a few wanted to eradicate it, and the Brooklyn bridge was built. But they didn't put it across that river as one completed unit. They started with a single cable, perhaps a single strand, and they added to it, each one doing its assigned work, until that strand became a cable strong enough to support that whole bridge, and the work was done, but it was not done in a minute.

There is one resolution that I want to offer to this Convention, not for action but simply for each individual here present to unanimously adopt for himself. We have heard of a thousand or less ways in which fire waste can be checked. We can each one of us put that knowledge into operation at once—we can add our strand to the cable; and don't let us go back to our homes with the feeling that if we cannot do it all, or the thing that seems to us absolutely important, we cannot do anything. Let us go back feeling we will do what the opportunity presents to us to-day, whether the least important method or the most important.

Perhaps we can go back into our respective States and get the factories into the ark and protect the human lives, which we all agree is the most important. As the Commissioner of Labor of New Jersey has described to us, that is being done in his State. Perhaps we can go back to our States and do something for lives and property as has been done or is being done in Nebraska for the horse—the next important thing to conserve, live property. Perhaps we can go back and do something for the inanimate created wealth of this country, as was well described by Mr. Doyle yesterday in the way of voluntary inspection and housecleaning in his State. And so, if everyone of us will unanimously pass a resolution in our own minds that we will go back to our own States and take up the opportunity presented to us to do one of these things, we will weave a cable which will far exceed the cables of Brooklyn bridge—a cable which will produce results of which neither this Convention nor any other convention need be ashamed.

And I want to put it strongly to every man here that he should go back with the firm determination to do something definite—it is results we want—and that he will do something definite in his own community or State which shall lead to adding a little to the prevention of fire waste in this country. And so I urge that our work must be carried on "line upon line and precept upon precept."

MR. EVANS: Before we come to the resolution we have a few minutes more on this general range of Topic 11—"Management." I will ask Mr. Hamburg, who is the chief of this work for the Prudential Life Insurance Company, of Newark, N. J., to give a summary of fire prevention work in his building.

MR. HAMBURG: I will briefly sketch the knowledge gained by actual experience with fighting fires for twenty years along the line of fire prevention, protection and equipment, and fire drills, as carried on in the Prudential buildings—which should apply in my judgment to all factory buildings where there is a large force of office employees. To illustrate: One of our buildings (which is given over to the printing and bookbinding department) is about 125 feet square, with ten floors, built throughout of fire-resistant material—steel frame and stone. Daily inspection is made from top to bottom at the close of the day's work. All waste is kept during the day in metal safety cans, and this is removed from the building at night under imperative orders. All inflammable material is also kept in safety cans. On each floor there are six 3-gallon fire extinguishers. The city pressure supplies 1½-inch hose on each floor, in addition to the sprinkler system with a pressure of 150 pounds. We have an organized fire-fighting force which drills outside on a vacant lot, where a fire is built and put out with the fire extinguishers. The building can be emptied of 300 employees in three minutes; 60 men with fire extinguishers can be concentrated on any one floor—10 men with axes, 10 with hooks, and 12 men with rubber blankets; and there are 3 men on each floor with a line of hose coming from the floor below where the alarm is given, also the floor above, as well as the floor on which the fire occurs.

There is a man on guard every day and night who allows no one to enter the building with a lighted cigar in his hand. We have a watch system under my own supervision whereby signals are sent in each hour, with no watchman having access to the clock or wires or dial. Every bit of rubbish in the building is removed every night. In the entire group of buildings there are 3000 employees.

MR. EVANS: Each one of these instances tells us how different people who are alive to this problem are caring for it; and when you analyze these several courses of action where results are being procured you will find at the bottom of it all is careful study and efficiency. I think this morning's session alone, with this record and these remarks behind it, is worth this entire week's work.

If you are now ready for the resolution I would suggest that in the line next to the last the word "populous" be omitted, so as to make it applicable to all communities. I also make the suggestion that the final line have the following additions: "Using the active fire-fighting organization for all inspections as much as possible, and all volunteer aid procurable." With these additions the resolution would read as follows (Reads):

What is your pleasure with respect to this proposal?

Mr. Mason moves and Mr. Price seconds the motion for the adoption of the resolution as read.

Motion carried unanimously.

Resolution Adopted on Topic 11

"It is the sense of this Convention that:

Based on evidence and opinions obtainable approximately one-half of all fire waste—including avoidable fires without fraud as well as arson fires—arises from ignorant, shiftless, dirty and vicious use of property (which condition causes an approximate-like proportion of sickness and immorality in all populous centers) and therefore minimum continuing requirements as to clean and orderly living and the suppression of dangerous fire-breeding nuisances (such as the snap match, dangerous smoking, careless storage of rubbish, ashes, etc.) should be imposed by law in all communities, through the agency of the police power, acting through State and municipal fire marshals (or like officials), using the active fire-fighting organization for inspections as much as possible and all volunteer aid procurable."

Topic 12—"Legislation"

NOTE.—This topic considers the need and scope of legislation to control fire waste.

MR. EVANS: I will repeat here what some of the speakers and some of the audience may not have heard before. We are extending our hearty thanks to those gentlemen who have prepared expressions of opinion and papers for us. That has been understood from the beginning of the conference.

The next topic is "Legislation," under the resolution announced. There are two forms of putting this view of legislation before you. I had hoped to have Mr. Herman L. Ekern, Commissioner of Insurance of Wisconsin, with us this afternoon to read his paper to you, but he has telegraphed that it has proved impossible to be present, although he had intended coming on for this purpose. Wisconsin has in recent years given us much advanced legislation on many subjects, so their view in respect to work of this general character is instructive. His paper is as follows:

"LEGISLATION"—I

By Hon. Herman L. Ekern, Commissioner of Insurance of the State of Wisconsin

OFFICE OF COMMISSIONER OF INSURANCE
MADISON, October 14, 1913.
POWELL EVANS
Chairman Fire Prevention Commission
Room 420, City Hall, Philadelphia, Pa.

MY DEAR MR. EVANS:—I am inclosing herewith copy of my address for use at the Fire Prevention Congress on Friday, 17th. This has been worked out somewhat in accordance with the ideas which I have already developed, and I have tried to put it in such form as to bring some specific results. It really should be accompanied by a draft of a bill which should be recommended by your congress. I shall appreciate having you present this to the congress in case I cannot reach there on Friday. If I can give you further suggestions on a uniform bill by that time, I shall do so.

Yours very truly,
HERMAN L. EKERN
Commissioner

The machinery for any continuous governmental activity in fire prevention must be provided through legislation in the several States. Either a new agency of the Government must be created or the power must be given to some existing agency. The National Government has no such agency except as it may be included in the very general powers of the Department of Commerce and Labor. Many of the States have a definite agency for this purpose in their State fire marshals and also in their industrial commissions or departments of labor, as affecting the safety of employees. Many municipalities also have their fire prevention or public safety bureaus.

The work of fire prevention must be advanced through the education of the public. From a newspaper and publicity standpoint it is only possible to keep the public attention directed to any particular subject to a limited extent and for a limited period of time. No matter how helpful such agencies as the press and public gatherings may be, their work cannot be either sufficiently all-inclusive or continuous to effect the results desired. Education of the children will undoubtedly bear fruit after a period of years, and perhaps have some immediate effect, and no doubt should be provided for by law; though it is well to recognize that the school curriculum is already more than filled, and conditions we are now trying to combat may be more or less eliminated when the children of to-day shall be in control of public and private affairs.

EDUCATING THE PROPERTY OWNER

The real problem is to educate the individuals who are to-day responsible for the conditions which make possible the enormous losses by fire of property under their control. This is a problem of educating the adult on matters relating to his business and his methods of housekeeping. The insurance companies cannot and should not be expected to undertake this education further than to keep their loss ratio within a reasonable proportion of their premiums. The public interest, which goes further—to the extent of eliminating losses altogether or reducing them to the lowest possible limits—necessarily must be cared for by some public agency.

Any well-defined plan for the prevention of fires necessarily includes the ascertainment and definition of the causes and the identification and diagnosis of these causes from existing conditions. The individual property owner cannot be expected either to have or to accumulate this information. It is not now available and its value is often but little recognized. The determination of the causes must be made after special study and upon the most complete information to an extent which necessitates that it be done by some governmental agency. The education of the property owner must come about through a continued reiteration to him personally of the hazards resulting from the conditions upon his premises. The result of placing the information before the property owner cannot fail to be the prompt removal of temporary hazardous conditions in the great mass of cases. Such conditions can ordinarily be removed at little or no expense, and self-interest will dictate prompt compliance with all fair and reasonable suggestions. Beyond this, the owner will be educated to keep in mind the fire hazard and avoid conditions to which his attention has been called or which his experience or information indicate are hazardous. When this stage has been reached the owner will be ready to insist that new construction shall be as substantial and free from fire hazard as practicable and the problem of building codes and even city planning will largely have been solved.

PERIODICAL INSPECTIONS

The prime necessity in the way of legislation is some provision for frequent periodical inspections of all property by public authority, either State or municipal, but under the ultimate supervision and direction of State authority. For purposes of economy as well as for convenience in organization, the direct work of inspection might best be left to the local municipal authorities, preferably the fire departments. This need involve but little additional expense to the present budgets. Such inspections by members of the fire department would keep the force occupied, improve discipline, and keep the members informed of the exact conditions on premises where their services might be required. A permanent record should be made of every inspection, and a copy furnished to the owner at the time of the inspection. This should show specifically the hazardous conditions to be remedied. The records of the inspections should be kept in permanent files, which should be the property of the State authorities supervising the inspections.

INVESTIGATION OF CAUSES AND MEANS OF PREVENTION

In connection with the provisions made for these inspections it is absolutely essential that sufficient financial provision be made for making a full investigation into every fire, large or small, and for gathering and tabulating statistical data with regard to all fires, and for such analysis of the data as shall lead to a determination of the causes and the best methods for the correction or removal of the hazardous conditions.

IMMEDIATE UNIFORM LEGISLATION PROPOSED

Each State should immediately make adequate provision for fire prevention work through the existing fire marshal or some other single agency, or through a single new agency created for that purpose.

The State should authorize its fire prevention agency to coöperate with like agencies from other States and with the proper bureau of the Federal Government in—

a. Establishing a uniform classification of causes of fires

b. Securing complete and uniform data with regard to all fires that occur

c. Classifying, compiling and publishing the same

d. Analyzing such data and determining and publishing the best methods of preventing fires under various conditions and circumstances.

Such initial classification would have to be made from the existing available data in the possession of the State fire marshal, insurance departments, fire protection or fire prevention associations and insurance companies; and the classification should be corrected and extended from time to time as necessary, but coöperative action should be had that all such corrections and extensions shall be uniform for all the States. To secure the necessary data with regard to every fire, it would be necessary to require reports of such fires from owners and occupants, and these should be checked by requiring a report of every adjustment of a fire loss on behalf of an insurance company and by comparison with the records of the fire departments. The analysis and study of the data for determining upon causes and methods of prevention should be made by the various State agencies in coöperation with each other and with the Federal bureau, and the publication of results should be made by the Federal bureau.

PERIODICAL INSPECTIONS SHOULD BE REQUIRED BY LAW

The State should by law direct its fire prevention agency to make frequent periodical inspections of all property within the State. Such inspections may be made directly, but preferably should be made by a special agency such as the municipal fire departments. This makes it possible to make use of the existing governmental machinery; and through the similarity of the activity to establish such inspections for the benefit of the fire protective work for which such departments are organized, as well as for the fire prevention work, and thus secure the latter at little or no additional expense. Such inspection should include a thorough inspection of every property from the roof to the basement, having in view the causes of fires most particularly applicable to the property inspected. Preferably, the successive inspections should be made by different men. Written reports of inspections, showing the hazardous conditions and pointing out corrections and methods of prevention, should be made in duplicate, and one copy delivered to the owner in person, if possible, and the other filed as a permanent record of the State agency supervising and controlling such inspections.

It will be well in any event to proceed slowly in attempts to penalize unwilling property owners in order to enforce orders for corrections and improvements. This will in most cases be quite unnecessary, but violations of law or ordinance should be reported to the proper authorities and correction of these or other hazardous conditions secured through prompt reinspections where the necessity exists. Some patience and painstaking work in inspections will soon educate public opinion to the extent of amply providing for and sustaining such action as may be required against any obstreperous individual or interest.

Law Should be General

The State law should be made as broad and elastic as possible. Except so far as may be necessary to conform to constitutional requirements or limitations no attempt should be made to define in detail the powers of the fire prevention agency or the methods to be pursued. The greatest possible latitude will be necessary that there may be complete coöperation between the various States and the Federal authority, and the greatest possible uniformity in the gathering and compiling of data. Such agency should also be in position to take prompt advantage of any knowledge so gained. There should be no need to await additional legislation while property is being destroyed by fires which are practicably preventable.

Advantages and Incidental Results

The advantage of this method of dealing with the problem is that it provides a continuous education to property owners and to the entire community which necessarily will be reflected in a growing demand for the prevention of fires, and for improved construction as a means of such prevention.

Building codes and city planning involve many other considerations than the prevention of fires, and it necessarily follows that progress along these lines can best be made through some deliberate action and direction from a permanent agency which can coöperate with boards of health and other State agencies equally interested in these problems.

Such inspections will arouse the individual owner to a sense of his right to be protected against the menace of a bad neighboring risk or conditions which may result in conflagration. As public sentiment develops and the need is felt it will be easy to provide and enforce any necessary regulations imposing legal liability upon the adjoining owner for the spread of fire, or subjecting the owner of premises where a fire originates to an inquest, to the reimbursement of fire department expenses, or even to the payment of a penalty.

PLAN NOW IN OPERATION

The necessary legislation is very simple, and in States which already have fire marshals would only require imposing upon such fire marshals the authority and duties outlined above. The greater part of the plan outlined is now provided for by State law in Wisconsin. Each fire must be reported by the owner and a copy of the adjustments must be mailed to the fire marshal before any loss can be paid. Every fire department is required to make inspections every three or every six months of all property within its territory, excepting the interiors of private dwellings. Unless such inspections are made to the satisfaction of the State fire marshal the share of the city or village in the fire department dues handled by the State is withheld. Inspections will thus be secured where otherwise there might be none. The fact is, however, that the chiefs of the fire departments throughout the State are on their own initiative taking hold of the problem in a thoroughgoing way, which promises well for the rapid building up of an efficient system for the State. It seems as though they only awaited the authority now provided by the State law. In like manner, it would seem that coöperative action between the States and cities which are now ready, aided by some Federal bureau, would rapidly induce participation by a sufficient number of the States to make the movement so general as to be nation-wide in its results.

MR. EVANS: You will note that so far in our program we have "rendered unto insurance the things that are insurance and unto legislation the things that are legislative." We have relied almost entirely for our technical data on men who knew their subjects to the bottom; but when a State-wide or nation-wide propaganda is launched it immediately runs into practical law-making and law-enforcing; and the officials who administer cities and States know what the people will bear and how to put on and impose reasonable regulation; hence we turn to them for practical advice on legislative and administrative measures.

The following paper by myself rehashes, I am afraid, much that you have already heard, although it presents some of the thoughts in a little different way. It was prepared under some speed and stress, but nevertheless I will take your time for reading it, although I am not sure this is right.

"LEGISLATION"—II

By Mr. Powell Evans

Proper laws and effective enforcement of these laws by an adequate in-every-respect personnel has been found in theory and practice absolutely necessary in our huge, complex modern civilization to produce any real control over the things that should be controlled in the common interest to the common good. This is an axiom in modern life. No specious arguments to the contrary have any real force. Hence, when it comes to keeping order and the peace and safety in our States and cities we employ continuously an adequate police force, and no other substitute will serve in the place of this army of officers on duty all the time and everywhere, else in the course of years it would have been found practical and actually used in fact somewhere, which is not the case.

Hence, also, to preserve the common sanitation, health and purity of food and water, controlling laws are found essential; and adequate continuous inspections are found necessary to enforce these laws, and many good men are now admittedly necessary to effectively inspect. Is not fire waste real enough, and widespread enough, and large enough, and sufficiently controllable—in the light of all experience and opinion—to be a great common danger?

Everyone admits these facts as a premise. With the danger and its nature admitted there need hardly be any further argument as to the right and present advisability of the Government to regulate it, or as to the means of doing it by law through the sovereign police power with sufficient men and money.

The *form* of this regulation, legally and administratively, is most important, but the way is clear. The States and their subdivisions are the units of control. The Federal Government has no place in the matter of controlling the sum of local fire waste other than to give its States uniform authoritative advice on the material facts involved in the question; except that the business of distributing this sum of local fire waste over the country by the insurance tax and its allied activities may introduce the problems of interstate and anti-trust regulation, but this question is now only hovering in the offing.

There is no *legal* difficulty involved in the unit State and city control of fire danger to life and property—it merely is not now sufficiently well or widely done.

Those who believe that popular education and the self-interest of the people are the avenues for this betterment should take stock of the ineffectiveness of these influences (which have been employed for many years) to date, and of the fact that they have landed the country in its present disgracefully large life and economic waste from fire. The arguments for actual widespread legal control of the fire waste by the imposition continuously everywhere of minimum requirements covering every problem involved are too strong from every point of view to be longer denied. What, then, in actual practice should we do and how should we do it? First of all the 48 States (which in turn each regulates its respective cities and country districts) should surely study and adopt identical *national standards,* described in identical language. These physical determinations could then afford a *safe and uniform basis* for enduring laws and ordinances; leaving the scope of the latter alone in subject, amount, extent, etc., to be varied to meet the taste, necessities and governmental structure of the several States. A *legislative and administrative* survey of this subject is as much needed in every State and city throughout the country as is the *physical* survey which has cost so much expense and activity during recent years (about 375 cities have been physically studied by the Fire Prevention Committee of the National Board of Fire Underwriters at great expense); and the results (with the associated digest of laws and ordinances) arranged in each case in intelligent shape would constitute an invaluable guide to legislators all over the country, which has hitherto not only been wanting but received almost no attention, largely because the need of it has not been realized. This program would be the soundest sort of constructive work, and affords an admirable field for the interest and activity of trade associations all over the country, working with the governments on the one hand (the sources of power) and the insurance associations on the other (the sources of facts).

More law is neither wanted nor advised. Reasonable, modern, intelligent, uniform, properly-covering law is wanted to take the place of the insufficient and inefficient ones now the rule. Then those who work out these laws and get them in the statute books can turn their united attention (which will be informed and solidified by the very process of studying and preparing the laws) to the matter of their actual enforcement. The above proposal incorporates in itself the very best sort of educational propaganda. Men learn best what they actually work out themselves in successful practice. No amount of law will replace the need of sound purpose and practice in administration. Good men and good morals and industry are as necessary for *applied* law as good laws themselves.

The above proposal covers everything necessary for real relief. Now as to the field for this effort:

Enforced laws are now needed to cover the following subjects:

1. BUILDING CODES (Physical)

(a) STANDARDS

This will be the first item because the adoption of the physical things which constitute standards and clothing them in precise language is the first step in drawing laws about any physical subject like fire waste.

(b) CONSTRUCTION

This would include consideration of "Exposures" and "Zones of Danger" as well as that of "Occupancies." It would have to cover the whole question of how buildings should be constructed to be safe from fire (including proper walls, wall and door opening covers, roofs, the division by fire walls into reasonable inside areas, incorporation of proper fire escapes, and the segregation of vertical openings for elevators and stairways in fire walls, the control of vertical and horizontal interior openings, the elimination of concealed spaces which permit the communication of fire beyond reach, the proper construction of chimneys and flues, etc.).

(c) EXPOSURE CONTROL

This has been touched upon above with respect to the unit building. With respect to the community exposure hazard there should be some regulation about public water supplies and protection and general living conditions which must supplement these—this interweaving with public protection.

(d) OCCUPANCY

This must care for the exclusion of pursuits that are inherently extra-dangerous from congested areas, and regulation of those dangerous ones which are permissible. It interweaves with the zone of danger scheme which defines the location of such occupancies; and also with the construction proposition so as to make these buildings reasonably right for their occupancies respectively. A law requiring a continuous occupancy license would be appropriate to assure that this regulation was continuous and effective.

(e) PROTECTION

Proper fire protection of large and high buildings and inaccessible cellar and other areas in buildings generally is admittedly growing more important each year—for instance, in theaters and the dangerous management areas of hotels, in factories and a large range of structures for many purposes. The necessary provision of proper public protection by law need only be referred to here again.

(f) EQUIPMENT

Legal regulation is needed to govern the character of lighting, heating, ventilating and power systems in buildings; the proper installation of ranges, stoves, gas and electric movable burners and appliances, moving-picture machines, etc., and the various other equipment involved in occupancy and management proposals.

The above physical considerations could be separated into parts and each legislated upon, or a total physical building code could be evolved which would care for all these things in appropriate sections. In either case the sum total should control the whole subject and neither gap nor overlap.

2. MANAGEMENT (Physical and Moral)

This would cover the whole control of cleanly, orderly housekeeping, and the regulation of every sort of fire-breeding nuisance, such as dangerous smoking, fireworks and crackers, holiday decorations, matches, etc. It would also control the handling and shipping of explosives, gasoline and volatile oils; the conduct of theaters, hotels and places of assemblage; the conduct of factories, with appropriate fire drills; the conduct of schools, with appropriate fire drills; the investigation, detection and punishment for arson; the use of active firemen for inspections, and the general collection and proper destruction of rubbish of all sorts.

3. EDUCATION (Moral)

A provision for education should be incorporated in all laws on the subject of fire control so that concurrently with work to stop fire waste the people may be continuously educated as to the need for such work so that they will support it more *intelligently and coöperate with it more effectively.*

All such laws should provide not only for adequate authority but for adequate money and personnel to see that the regulations are actually carried into effect. It is also desirable that all such regulation should be reasonably open to public knowledge and that the way should be open as far as possible for volunteer effort to coöperate with the authorities. Certain phases of this legislation should undoubtedly be State-wide in its application to at least a minimum extent, while leaving the subdivisions of the State free to increase these requirements locally if they see fit. No argument to the effect that the imposition of minimum requirements about this common danger is inadvisable—because in time such minimum requirements might be in fact considered ample and stop or retard the adoption and use of better requirements—is sound. This is a do-nothing policy and has been followed too long already and is responsible for a good deal of trouble now existing on this subject.

The *State law* should certainly cover a building code, including fire escapes; the manufacture, handling, storage and transportation of explosives, gasoline and volatile oils, matches and fireworks; the use of uniform hose couplings and steamer connections for the interchange of fire-fighting facilities, and a fire marshal office.

City ordinances should cover the local application of all State laws to the minimum extent at least demanded by the State law, and as much higher as the local public opinion and necessities demand; and as many more subjects of local need as the facts demand.

Every State and city should continuously collect daily in detail a record of all fires and insurance losses and list these under uniform classified headings and summarize and publish them; and should further use all this accurate, complete data on the subject as a basis for studying the causes of all these classified fires; and appropriately legislate and regulate to control and abate these—this being a particular duty of the State fire marshal.

There are already in existence a vast number of forms of State laws and municipal ordinances covering the entire range of this work. What is now urgently needed is a strong organization working through an appropriate committee to survey this entire field of activity and bring order, uniformity and classification out of it, for the use of legislators all over the country.

The principles and practice of legislation on the subject so worked out when applied to the actual physical conditions existing in any State and city would furnish the key for appropriate legislation at any time and place.

It must be constantly borne in mind in every scheme of legislation that *division of authority* in control of any subject is fatal to effective results; and further, that too much restriction of freedom of action of sovereign communities like large cities is equally baneful in effect.

In Philadelphia eight different departments were shown to be in control of the subject of fire danger and its control. The mere enumeration of this distribution of control, the lack of responsibilty which it forced, the conflict and gapping and overlapping of regulation, when made public, began to change the situation. Such light on the necessities of each case will always in time produce a solution.

There were 5300 fires in Boston during 1912—half of them caused by carelessness and lack of proper regulation. The power and authority to regulate such matters there is yet scattered among seven different departments—none of them responsible for fire matters as a whole; most of them without sufficient men to enforce the authority they have; and the fire department, which has the greatest knowledge and experience, with the least authority of all.

The Orange and High Streets fire in Newark, N. J., in 1910, which cost many lives, brought out the fact that there was a jumble of insufficient, inefficient and unrelated State and municipal laws in New Jersey and Newark which made it impossible to control the fire hazard in those localities, or to place responsibility for any such holocaust as in that case; and the light and study which resulted from this event has brought about the present consolidation as a State proposition of authority about fire danger in the hands of the Department of Labor, which merges the usual provision of a State fire marshal and a State factory inspection department into this one bureau.

The Asch Building or "Triangle" fire on Washington Square, New York City, March, 1911, which cost so many lives, showed a like defective fire danger control in that city, which has been largely corrected since then and is still undergoing improvement.

The New York State Department of Labor now has a division of supervisory authority in regard to fire hazards between that department and the State fire marshal's office, which is slowly being worked out to a finish to make the whole control effective.

The recent factory fire in Binghamton, New York, demonstrated that the existing control in New York State and its cities is yet inadequate to reduce fire danger in that part of the country to its reasonable limit.

The Pennsylvania State Department of Labor and Industry has offered to delegate to the inspectors of the State fire marshal the powers of its department, with the suggestion that the State fire marshal take the same step in turn. In other words, if this plan is carried into effect all Pennsylvania State fire marshal inspectors will also have the power of the Department of Labor and Industry, and *vice versa,* which is a practical consolidation of these two departments as far as coöperative work goes. It is an admirable practical step.

The State of Wisconsin, which began with a fire marshal in 1907 (who up to 1911 gave his principal attention to the prosecution of arson cases—as most such officials do until they get down to bed-rock facts for the necessity for fire prevention in its broadest phases) has finally worked out a virtually complete coördination of all functions in the State Government looking to the prevention and control of fire.

The State of Ohio on the whole has accomplished the most effective plan in working out an effective control of the fire hazard and in educating its people about it, yet the recent large fire in Cincinnati brought out clearly afresh the dangers of poor building construction and exposure protection in city congested areas.

There is no need to multiply comments or instances to make the necessity clearer that *minimum legal regulation* is needed all over the country on the whole subject of *fire danger and control.*

Each State and city must first study its own problem, then work out its practical solution from the general data and experience obtainable as applied to its own locality.

MR. EVANS: Remarks are now in order on this subject.

MR. COLE: I think that we should be very careful to look at legislation from a practical and not a theoretical standpoint. No man believes more firmly in giving this inspection work over to the fire department than I do, but we must look at it from a practical standpoint. The trouble in Massachusetts is that in some cases we have the legislation, but the different departments given the power thereunder are not given the means to enforce it.

The same condition exists with the fire-fighting force. And we must not forget that the fire-fighting force is intended primarily for fighting fires and we cannot weaken it. It can do a great deal of inspection, but I cannot concur with the idea that it can do all this inspection without an extra appropriation. Throughout the city the fire companies (in fact all over the country) may have twelve, thirteen or fourteen men each. During vacation one man is off. In a company with thirteen members that brings it down to twelve. In Boston we have a day off in every five, and that brings it down to nine. During meal hours one man in every three is off during the same hour. That brings it down to six. We should have at all times in the downtown districts a company of seven men to respond with a first-class steamer.

Therefore, in Boston—and I think it is the same in most cities—the time for inspection would be limited to the time between meal hours; and a great deal of inspection could be done at that time. But in my opinion there should be established a branch of the fire department known as a fire bureau or branch where a few men would have to take up with the central office the whole inspection work, and the fire-fighting force would simply be an addition to that bureau.

Another thing. A fireman works 24 hours a day and you can't expect him to do 8 hours' inspection and then keep him at work the other 16 hours. If you keep him on inspection 8 hours you must give him the other sixteen hours. It is a part of his business to get a knowledge of the buildings in his district, but I want to bring to the attention of the Convention the fact that the fire-fighting force cannot do it all with their present complement of men.

MR. EVANS: If I may be allowed to make remarks now on this subject, I will bring out the thoughts, in answer to Mr. Cole, that in the majority of cases our experience here would indicate that the fire-fighting force could do more inspection than they have thus far done, by more coördination of their time and effort. Fire-fighting forces throughout this country to date have been living along without much thought except running to fires bravely. They haven't been efficient, in Philadelphia at least, but ought to be; and as intelligent as any other branch of public service.

For a year we contended here that if you educated them they could do efficient inspection work; and what was the answer? The first thing was to list the personnel on a time-map, analyze their present work, and see what they were doing. And what were they doing? Wasting more time than we asked them to put into this work! Take, for instance, in this city to-day, out of 75 active firemen now on this inspection work a third of them had been sitting around theaters as part of their usual night duty and doing nothing for hours. What was the thing to do?

Find an effective theater control that required only 5 or 6 men, and turn the other 19 into some other line of work! That was one instance; but we found throughout the *regime* that from top to bottom there was no brain power. We stimulated that process of thought, and where men wouldn't think they had to get out. This course furnished the answer to existing conditions. We gave the administration such ample proof of the correctness of our view that we secured its unqualified support; and the thousand men we had to deal with in the fire department soon found that neither politics nor any other influence counted for a second against actual performance. They found that their jobs demanded work to be done, and they must attend to it or quit. I fully believe that modern efficiency, instead of the old rule-of-thumb methods, should govern the fire-fighting forces of this country. You cannot inspect property without men. If you inspect 100,000 buildings twice a year you can't expect to do better than 5 to 7 buildings a day per man working 7 to 8 hours per day.

Further, you should have a man, charged with his local area, do local inspection work; and I believe that one man from each company is the best rule (our established *regime* here now). When we started that plan here, what happened? We picked out for inspectors men who looked as though they wanted to think, and put them on these new duties. They would return to their fire houses at night, after climbing through buildings for 7 to 8 hours, be jeered at by everybody else in the house, and be given more work at night because they were actually doing something new and really useful. Then we had to get at the man higher up who permitted such abuse. When we caught him he either trotted straight or trotted out. A little more thoughtful work and less politics is needed, and not more men or money; but if you need more men and money you will get them if entitled to them.

Mr. Cole: Mr. Chairman, we have been doing this inspection in Boston for many, many years. We are not half so big as Philadelphia, and I think we made as many inspections—almost—as you did here last year. We have had the city divided into districts and subdistricts. We have not only one man but two making inspections in the districts all the time. But notwithstanding that we do not and cannot do all the inspection work that should be done, and reinspections that should be done. And I speak of a department which has been doing its inspection work by the fire-fighting force for years. It is nothing new to us, but we need more men and need to do more inspecting. I know what they would do to me in Boston! If I take one man off for meal hour and reduce the company from 7 to 6 or from 6 to 5, I might as well hand in my resignation. As it is, the papers are continually hammering at us. We need more men for the fire-fighting force, and certainly need more for the inspection.

When we come to legislation, last year we presented a very simple appeal to the Massachusetts legislature asking for the privilege of forming a fire prevention bureau—asking no additional appropriation or additional men; asking that the powers now in seven different departments be listed in one department; and asking for power to regulate the accumulation of rubbish. That is all we asked. It passed the House and didn't even have the dignity of a roll-call in the Senate; and we had the Chamber of Commerce, the Massachusetts Fire Prevention Association, insurance people and a lot of other public-spirited citizens come up and speak in favor of it. We must ask for it again. But I do want to impress upon you that you need somebody in addition to the regular fire-fighting force to do all your inspection and do it right.

MR. BARSTOW: I have wanted to ask a question ever since I came. It is about a matter of legislation, and in order to get at it I will have to arrange a few facts before you. In New York, up-State is separated from the control that is exercised over New York City, as you understand. Up-State we are a little pessimistic at the present time about the efficacy of State or municipal bodies in inspection work. For example, the State fire marshal had deputies throughout the State. One man has been working in our section for the last year. He made in the city of Rochester 10 inspections and served 10 orders upon different people for work to be done. This created such an uproar that it was brought to the Chamber of Commerce for suppression. We found that the 10 orders served upon these people were orders that conflicted both with the State fire marshal law and the municipal ordinances; so we asked to see the inspector. We found him an estimable barber from a small town near us, whose sole qualification was that he had served on a volunteer fire company for two years. This State fire marshal presumes to appoint an inspector to come into a city—I don't care what city—and go through factories where the work has already advanced beyond the kindergarten stage and tell these people to do ridiculous things. In one case he ordered 2000 feet of wiring out—wiring done and approved in accordance with the National code. Now in our city, where we have done fire prevention work, we have never met with a rebuff; they are wiser than that. It is the friendly indifference that apparently kills the work of inspection in a systematic, intelligent way such as you have outlined.

What I want to know is how you arrived at the situation in Philadelphia whereby your administration was committed to a fire prevention commission first of all—not a fire marshal—and how you got the support of the administration in your work?

.MR. EVANS: Well, Mr. Barstow, I think that already has been told at quite sufficient length here. In the first place, we have got a sound administration here; and as a partisan of the present administration I had a certain status personally; and as a crank on the subject I took this tale of woe to them and they were broadminded enough to give me and the men associated with me an opportunity to work—and we went to work. It is only started now and it must be kept up; but it is run as an engineering business. That is the point! Unless this whole thing is run as a business—a business equipped with adequate experience --you won't get anywhere at any time. I feel safe in stating that it is virtually impossible, or has been for a generation, for any man but an engineer to become president of the Pennsylvania Railroad. Why? Apart from hiring counsel to attend to its legal phases, and business men to attend to the commercial phases, the fundamental, basic business of running the Pennsylvania Railroad, or any other railroad, is an engineering proposition. So the controlling spirit there must have a basic and successful experience in engineering. I am convinced that this fire control business fundamentally is engineering; and any man who plans to make much headway in it must be able to see the sources of danger and its connection in engineering terms. He must also know something of law, something of politics, and must equip himself all around to find and rout out those Argus-eyed monsters of indifference and political influence; but first of all he must be an engineer. I am free to admit that unless you have an administration which wants to make good there is smaller opportunity for effort. When a man here is told to put a fire pail on a certain floor, or do any certain thing, he can't get out of it, no matter how much he would spend, and this community recognizes this condition. We have the power to enforce, and are organized to enforce, our mandates. I am convinced that if you put enough action and enthusiasm into the work, and act wisely, and intelligently and temperately in each case, you can get through the barricade somewhere by the force of public opinion.

In starting the fire marshal movement in 1911 I went to different organizations and asked them to call a city meeting. We wanted to stimulate enthusiasm and put the plan through. One man said it was not a function of his crowd, their work being simply to discuss civic problems. Another body was really a student body, they told me—not constructive or organized to go into any militant movement. I then walked out of those offices and called a public meeting myself, by writing to the various trade associations and naming a convenient and appropriate time and place. I got 50 of them together, including city officials whom I was fighting at the time. I got data ready and gave literature to the group; and we secured our State law; and further, got the city to change its announced proposals into the present city law we now have. Successful work in this field simply requires knowledge, energy, any amount of brass, and some money for proper expenses. I believe anyone can go home from here and do likewise.

Mr. Mason: I would like to say that was our experience in Cincinnati. First, we got a good capable administration, and then unofficially a few men presented publicly the facts about fire waste as affecting that community. It only needed that to set in motion our present fire prevention policy, with adequate inspections by the fire department, and enforcement of building regulations, and other things making for reduction of fire loss.

But there were two points in the Chairman's paper to which I want to allude—the educational value of the law itself, and the other, the control of exposure. Twelve years ago there was passed the first real modern fire marshal law in this country, which was simply a means of control of the Williamsport County (Ohio) firebug. It had no power except to eliminate incendiarism. Its work was so important that they added to its power, and the result has been that within ten years the fire loss has been reduced in Ohio from $12,000,000 in 1901 to less than $6,000,000 in 1912, while property values have nearly doubled.

Control of exposure is akin to enforcement of individual responsibility with respect to your neighbors. In Cincinnati it is enforced by law and is given the utmost effect by decision of the supreme court of the State. We had a case in northern Ohio three or four years ago in what is known as the black soil region, where the subsoil is substantially peat. A farmer there had a small wood lot, but fairly closely grown, and next him was a 5-acre tract belonging to another farmer and cultivated. Beyond that was another wood lot belonging to a third farmer—somewhat like the congested Philadelphia district on the Philadelphia map. Fire broke out on the wood lot on the east and burned for some time; was communicated to the peat subsoil, traveled under the cultivated farm and traveled to the wood lot beyond and destroyed several acres of valuable standing timber, mostly oak and ash. The man owning the timber brought suit against the man owning the first timber lot for damages, and lost his case in the lower court. He carried it to the Circuit Court of Appeals and won. The other man then carried it to the Supreme Court of the State, yet the man suing won his case in the Supreme Court and the judgment has been paid—several thousand dollars. If a case of that kind can be won it seems to me there ought to be no trouble over the enforcement of adequate exposure control and adequate damages for exposure fires.

Mr. Evans: If there are no other remarks we will revert to consideration of the resolution. (Reads resolution.)

Moved by Mr. Cole, of Boston, seconded by Mr. W. H. Whyler, of Cleveland, that the motion be adopted as read.

Motion unanimously carried.

Mr. Evans: That closes the program for this morning. A motion for an adjournment is in order.

On motion the meeting adjourned to meet at 2 o'clock P. M.

Resolution Adopted on Topic 12

"It is the sense of this Convention that:

> While fire loss of life and property is always local in inception, its result is national in effect, and hence its control must be effected by the operation of a sum total of State and municipal laws which will suppress the range of fire hazards to an attainable minimum everywhere and all the time; and that by this course alone can the sum total of fire waste of life and property be speedily and substantially reduced, and the cost of fire insurance (which reflects this total loss) be lessened throughout the country."

FRIDAY AFTERNOON SESSION

Topic 13—"Education"

NOTE.—No program can succeed unless understood by, and in sympathy with, the mass of the people; hence consideration here of the problem of widely informing the nation about the physical phases of fire danger and waste and the imperative need of reasonable legal regulation on the subject.

The meeting was opened by the Chairman at 2.15 p. m.

MR. EVANS: Our next Topic is 13, "Education," under the tentative resolution as announced. We have in a single individual here with us to-day the best complete knowledge that any one man possesses on the educational phase of fire control. You need nothing more than this remark for the introduction of Mr. Franklin H. Wentworth, Secretary of the National Fire Protection Association, of Boston, who will now address you on this subject.

MR. WENTWORTH: I don't know whether there is any unhappy connection in this talk of mine with the topic No. 13. If so, it would not be because the topic is No. 13 but because education is such a dubious term. I was just wondering what education really was! A man may be a good civil engineer and not be able to grow vegetables. There is a story of a farmer's boy in Maine who knew how to run the farm and grow things beautifully. His mother was ambitious for him to become a lawyer, so he went to Bangor and into a lawyer's office, and stayed there two months dusting, cleaning cuspidors, etc., and went home. He said: "I don't like the law. If I had known what it was I wouldn't have learned it."

The term "information" is what we should use. I don't know how much we can educate, but the deliberations of this Convention ought to equip some of us to inform the public about certain things with which we have been connected. It seems to me that Mr. Redfield really sounded the keynote yesterday when he said: "The psychology of the American people must be changed." We must get the people to appreciate what we are up to before we pass laws which will perhaps be evaded; which can't be enforced until public sentiment rises to that level. We have all seen splendid public officials elected. We have seen them determined and trying to enforce legislation, and have seen them defeated and driven out of politics the next year. Public intelligence has not risen to the point where it is willing to countenance the enforcement of some laws; so if we attempt to make laws before the people are ready to obey them we will simply lose our best public officials.

It seems to me we should not lose our sense of proportion in this matter, and Mr. Redfield has given us the keynote. The interesting thing about his speech was, to my mind, that he gave the advice we have been following for the past five years in the National Fire Protection Association—to get to the people and get their conscience awakened on this important subject. As has been said several times on this floor, the National Association was originally only a standard-making organization. It has only recently attempted to awaken the people to the waste because of fire loss. We began by sending out bulletins to the press. At first the editors didn't know any more than the men on the street. We had to get out the bulletins and send them to the papers, to get individual editorial converts. We tried that four or five months but didn't succeed in stirring up much public attention. Then we issued Fourth of July bulletins. We thought we could concentrate on this. Five years ago the deaths averaged 200 and the casualties 5000. We have members in all parts of the country who concentrated on this one thing. The result is well known. Ordinances have been enacted and Independence Day transformed. Then we issued holiday bulletins at Christmas time. We explained to the store people, also to the janitor, how carelessness might burn the store. We went after the citizen and got him to use metallic decorations on Christmas trees and keep matches from young children. All this we attempted to do by these bulletins. We have issued one just now on the hazards of the home.

The newspapers took this up in a haphazard way and printed a number of our bulletins, but it was hard to get even the editors to be the leaders of public opinion. A year or two previous to that, the Chairman of this meeting, Mr. Evans, through his influence induced the National Association of Credit Men to become an active member of our association. They became an active member but didn't take any interest; until through their secretary, Mr. Meek, we laid out a campaign that got the attention of the credit men. Mr. Meek went with me from one end of the country to the other speaking on this question. Through the influence of the local credit men (who have more or less relation to the advertising) the newspapers were induced to pay some attention to the campaign we were making. Thus in a few cities we awakened a few intelligent men to see the significance of this problem and go to work. Last year we did the same thing with the American Institute of Architects, who arranged meetings in all the large cities of the United States and invited the mayors, public officials, chambers of commerce, etc.

We have simply talked of the economic side of the fire waste. We have tried to touch the pocket nerve. Manufacturers know that the cost of insurance is merged with the cost of the goods and passed on to the ultimate consumer. They put in automatic sprinklers and other equipment; have fire squads and other things to prevent fire waste. They realize it, but the man in the street does not know that when he buys a hat or shoes or coat or anything he pays that fire tax. He doesn't understand it. That is why he is indifferent to the fire waste. Cotton, for instance, is insured in sheds, in transportation, in the warehouse, and in the textile factories and department stores. All the way along from the cotton field the cotton pays that fire tax and when you pay for the cotton goods you pay it all at once—in a bouquet!

If the people realized in their struggle for a livelihood that this $250,000,000 a year doesn't come from nowhere but from somewhere; that it is a tax laid upon them! That is what we want to preach through architects, credit men, educators, through anyone who will listen; but not many will listen—yet.

What are we advocating? We have looked about to see what other forces might get into this fight. We saw that only half the States had fire marshals (we had one in Massachusetts but the politicians put him out of business). We have been attempting to impress upon all the people this idea of a State official, a fire marshal not paid by the insurance companies. Would you let any other private business pay a public official? We should see that they are real public officials, paid out of the public treasury. They should be statisticians; through the local fire department or some source of inquiry they should know exactly what the fire waste of their State is and transmit it to those interested. We would like to have the Federal Government collect and assemble such statistics. It would save us an immense amount of labor. There are fifteen or twenty States in which there are fire inquests—fire marshals. Fire marshals should be educators. They should by means of bulletins (and they do in several States) educate their people; inform them and educate them. They must be prosecutors, real prosecutors, checking arson. The trouble in this country isn't over insurance but because of sympathy with the man having a fire. It is almost impossible to get a conviction for arson because of sympathy with the "poor fellow" having a fire!

Next we went after fire department inspection. In Cincinnati, in the winter of 1910, the credit men held a fire waste meeting, and we discussed the matter pro and con. The mayor was not in favor of fire department inspectors. Beginning that agitation in 1910 it was not until at least a year had passed and Cincinnati had a new mayor that those interested got this inspection started, and it has been making a splendid record. But you must first have the right officials. I don't believe that Philadelphia would have had such inspection started had it not been for Mr. Evans and his seriousness and push. If you try to force a thing on an unwilling public you are not likely to accomplish much. We wanted two things—the fire marshal and fire department inspection. Both of these features are educational. By changing the psychology of the fire chiefs the service is improved and broadened.

Their departments do not lose the ability to extinguish fires because they give a little thought to their prevention.

We have advocated education in the public schools and we want to get into the curriculum a syllabus and one or two other publications pointing in that direction. Several fire marshals have prepared courses of lessons, but they are not very good from a pedagogical standpoint. The educators reject them. Personally, I am not sure that a course of lessons is needed. We have too much now in the curricula of the schools. A fire prevention "reader" would be the best plan that could be adopted; and have that reader used one day a week. We have been carrying on this sort of public educational work for five years; and it seems to me we have gone as far as we can in that direction. We must carry our propaganda into the byways and lanes. We must organize a force in each city which shall be continuously on the watch. This plan was brought to our association by a member of our executive committee, Mr. Evans; and it was considered for a year by our executives very carefully.

There are a good many things to consider in establishing local branches to such an organization. But the resolution which Mr. Evans introduced a year ago has borne fruit and we have planned to put into effect a plan of organization the coming year which we believe will give new life and new impulse to this movement. And to-morrow, if there is enough time, I will tell you more about it.

Mr. Evans: Please permit me to make a comment on this topic now. I have talked with Mr. Wentworth until he is tired of seeing me come around, and I will say a few things to you that I have said to him. If there has been any virtue in our deliberations here it is due measurably to the fact that we have said just what we have thought from time to time. The National Fire Protection Association, to my mind, is the proper organization to carry on this work; and the official correspondence which leads up to that point was carefully incorporated in the program and final formal invitation sent you (see Appendix 1, page 344). The National Fire Protection Association has had its work circumscribed to a degree by a feeling that its control and point of view was lodged in expert insurance circles. Originally their work was all done by insurance representatives and to their great and everlasting credit; but during the past seven or eight years there has been a gradual accretion to its membership of strong groups of men in engineering and trade circles who are adding their total force to this movement and balancing the insurance point of view within this organization.

That is why, in calling this Convention, it was understood that we wouldn't waste time in discussing a tremendous thing like insurance rates, but the whole point of view of the people from the standpoint of the administrative end. The public, and the manufacturers, and the insurance interests should all come fairly and frankly out into the open; and the agency of the National Fire Protection Association should put all these views fairly before the people to get balanced judgment on this whole subject.

There is one other point I should like to illuminate a little before passing from this topic. There has been frequent suggestion here within the past two or three days that a national propaganda for control of our fire waste should be carried on as a part of laws and ordinances. I want to emphasize the workability of that thought and the need of it. When I drafted the fire marshal law for Pennsylvania I included in its provisions a mandatory requirement that information should be sent out to the people of this State in a continuous manner, without undue labor or cost. It had occurred to me that if the State fire marshal would think out what he had to say about this subject and print about a million circulars embodying it, and be authorized to send these to every office that issues receipts for taxes, which offices should be required to deliver with each one of such receipts one of these circulars, it would afford the simplest means possible to drive home, at least once a year, and put into the hands of every property owner paying a tax the fundamental situation with respect to the fire tax.

This law has been in effect since it was approved June 3, 1911. The Governor appointed a fire marshal a few months thereafter; but he has not as yet availed himself of this admirable and cheap means of communicating with every property holder of the State, and I think that is a lost opportunity of great import. This provision is incorporated in Section 9 of the State Fire Marshal act (see Appendix 5, page 440).

If that provision were complied with there would be, first of all, the distribution of information; second, the requirement on the property owner that he should fill out one of these blanks and turn it in, and in six months do the same thing again. It would put him on record about his property in an official central office. Suppose the law cannot enforce the return (because there is no power to that effect in the law to-day), yet there is an educational value in the process, and a great many citizens would read the information thus circulated.

In one department of my business (I make the reference to illustrate this point) we try to reach a great range of people all over the United States. Sometimes we simply take a postal card, as big as the postal regulations will permit (8 by 12 inches), and try to have it put up in a striking way, and frequently send out 30,000 of them at a time. It is surprising, when you send out a thousand or two into the Western States where you have a little trade, how many inquiries come back! These fire control circulars could be written in a readable, non-technical manner, and would afford a cheap and effective means of education to every property owner who pays taxes—and that takes in almost every property owner I have ever heard about.

Mr. Guerin: I would like to mention what has been done in the city of New York. I want to thank the National Fire Protection Association and Mr. Wentworth for the suggestions given us. At the outset of the work we established a statistical table of fires, returned monthly by the fire marshals; and for two years that table has read exactly alike each month, and at the end of the year totals up the same percentage of figures, with the astounding result that 60 *per cent. of the fires occur in the homes of the people.* It is well to go into the theaters and hotels and factories and make them do the things they should do; but you can't walk into a man's home so readily. If 60 to 65 per cent. of the fires occur in the home you must solve that problem, and it is a big one. There is only one way to do it and that is by education.

We put into service in our public schools the plan suggested by the National Fire Protection Association. I went to the superintendent of public schools and he said: "I am willing to put into practice your plan at any time. You can send men in for ten or fifteen minutes every morning. Also, if you will get up some small lecture slides explaining the fire danger I will see that your men get into our lecture centers." He thought that fire prevention would be as entertaining as any of the lectures.

Through this one avenue of education we will reach over a million children in the public schools, and we will reach the fathers and mothers in the night lecture centers. I tell you what we are doing, as it might be helpful to somebody else.

Mr. Harrison Parkman (Topeka, Kansas): Out in Kansas City we have had a campaign of publicity for the past six or seven months. We find that people are only too willing to listen and be convinced; but the first proposition we were up against was that when the fire insurance companies issued a statement that they were paying three to four million dollars in losses in Kansas a certain year, the people wouldn't believe it. I issued the statement that the estimated loss last year was $15,000 a day and it brought out a flow of letters asking about it—whether an error had been made. I also found this same spirit running through the newspapers. The Fire Prevention Association of Kansas had been sending out publicity to newspapers in Kansas, and out of 750 papers it had been published in but 5 per cent. of them. The words "fire prevention" and "fire insurance" went hand in hand and were supposed to be an advertising scheme of the fire insurance companies. But I find that when you remove that impression and get away from the companies the people find you are not working an advertising scheme. The newspaper men are only too glad to take up a topic the people want to hear about.

Mr. Wentworth spoke about sending pamphlets to his association members in the State and having those members persuade the newspaper men to publish them. If you can give a readable story it is accepted gladly and the people like to read it; but to get results I claim that you must get out stories that a man will sandwich between murder stories—that is, the ordinary man. In Kansas the publicity matter of my State fire marshal office has been used in over 85 per cent. of the newspapers throughout the State, and I believe such matter printed in a paper of six to eight hundred circulation is as good in its way as in the paper of two hundred thousand circulation. The first thing I took up was the Fourth of July question, and at the same time I took up with the newspapers all the ordinances of the city. The ordinances were sent out two weeks after the newspaper campaign started, and the success resulting was shown by an instance of a town near Kansas City in which the ordinances were passed twenty minutes after they received them. In the months from April 1st to September 1st the fire losses in Kansas averaged only $2000 a day, and our loss in the entire State $2600 per day for the entire year. The same proposition will apply to prosecution for incendiarism. In Kansas City we were up against the same difficulties that have been met with in other cities when trying to enforce the arson law. There was no public sentiment back of the law and it was almost impossible to obtain convictions. We find now that the public sentiment is at our back, that it is easy to obtain conviction for violation of the law. We find, as a rule, that it is hard to convict the incendiary. At present there are several people bound over for the district court, and seven in jail waiting for sentence who have confessed; but it is easier to get a confession for arson in our State than it is to get a conviction.

Mr. Evans: We have just heard an authoritative voice. Mr. Parkman is the State fire marshal of Kansas; and is one of the officials in charge of the daily execution of all this work upon whom we must depend to raise the public ideals. He has also been a newspaper man.

The idea of getting pamphlets handed out to county treasurers could be worked successfully by fire marshals. I think such pamphlets could be gotten up attractively and sent to the county treasurers with the request that they hand these out to the people when they pay their taxes. When a man gets anything with his tax receipt and finds it to be something that will reduce his taxes, he will be glad of the knowledge, and is apt to act upon it.

Mr. Barstow: May I pay tribute to Mr. Wentworth and the National Fire Protection Association and show in a few words the reflex action of the association in my own town, taking into account only the Fourth of July movement? In 1907 the National Fire Protection Association first sent out its circular and started the educational campaign to reduce the fire waste ever present heretofore on that occasion. We had 112 accidents on the Fourth of July that year and two deaths. There were no restrictions up to that time. Retail storekeepers had gunpowder in the back of their stores—scooped it up and weighed it loose on the scales, and sold it in paper bags. Now we think that was criminal. The next year we put a prohibition on cast-iron cartridge pistols. We thought we would get the people to understand the idea. I had in my office a cast-iron pistol, costing 25 cents, such as they sold in 1907. The people took to that kindly and they eliminated gunpowder and later the 6-inch and 8-inch firecracker. Still later the storekeeper came to me and said: "It doesn't pay any more to handle fireworks; will you please stop it altogether?" They came to me that way after five years of educational work, thanks to the initiative of the National Fire Protection Association.

The city of Rochester owes a great debt to Mr. Wentworth and the National Fire Protection Association. It was through his instrumentality that there was a meeting of the Rochester Credit Men's Association and the Rochester Chamber of Commerce. We have now been at it over four years, but I feel that the whole thing is due to the National Fire Protection Association, and credit should be given there.

Mr. Gasser: The city of Newark, during the last two years, had neither fire nor accident due to the sale of fireworks. The people are just as happy as prior to 1907.

Mr. Evans: If there are no other remarks I will say in conclusion that I don't think we begin to estimate correctly in this country the credit which the National Fire Protection Association deserves. My whole belief is that we need it so much it ought to double its work.

The resolution is now up for consideration. (Reads resolution.)

Mr. Wentworth moved the adoption of the resolution as read. Mr. Guerin seconded the motion. Motion unanimously carried.

Mr. Evans: This concludes the formal program this afternoon. You have all been invited to witness a complete test fire and fire drill at the plant of the Victor Talking Machine Co., at the foot of Market street, Camden, as soon as you can reach there. One of our valued conferees, Mr. Troth, is in charge of that service in that large and first-rate plant and assures me the experience will be well worth while.

Immediately thereafter one of the city fire boats will exhibit at the Victor wharf and then take us for a ride around the harbor.

This evening Messrs. Bryant and Porter will give us an interesting fire control lecture with lantern slides and moving pictures, and the secretary will provide you with tickets.

On motion the meeting adjourned.

Resolution Adopted on Topic 13

"It is the sense of this Convention that:

> Education of the public about fire danger and waste of life and property should be provided in all laws, ordinances and regulations on the subject; and all interests concerned should not only join issue in collecting accurate and authoritative data but make equal effort to disseminate this information regularly and continuously among all the people in readily understandable language, to the end that they may not only accept but demand proper fire waste regulation and live in full accord therewith."

SATURDAY MORNING SESSION
October 18, 1913.

Topic 14—"Insurance"

NOTE.—Despite all future effort and regulation some fire waste must continue, hence consideration here of Insurance, or the distribution financially of this waste.

The meeting was opened at 9.20 o'clock by the Chairman.

MR. EVANS: Our topic this morning is No. 14—"Insurance"—under the tentative resolution announced.

The first section of that resolution (a) will be particularly the subject of the gentleman who will now first address you. Mr. Rawle has been so well and long known to the legal fraternity that he needs no further introduction than the statement that he is an ex-president of the American Bar Association.

"A STANDARD FIRE INSURANCE POLICY"

By Mr. Francis Rawle, of the Philadelphia Bar

I didn't prepare this paper because I knew so very much about this subject, but I had some thoughts on standardization. They were the lines I was working along in our own organization.

I have been asked by Mr. Powell Evans to speak on standardized fire insurance policies from the standpoint of one of the insured. If at the outset I may venture upon a personal remark, I will say that Francis Rawle, of Philadelphia, in 1725, published an essay addressed to the legislature of Pennsylvania with the somewhat ponderous title of "Ways and Means for the Inhabitants of Delaware to Become Rich: Wherein the Several Growths and Products of These Countries Are Demonstrated To Be a Sufficient Fund for a Flourishing Trade," in which he was the first person on this continent to advocate the establishment of insurance "offices." He discoursed in the forepart of his essay on various branches of trade and then proceeded to say:

> "There is yet one great Encouragement to adventure in the Discovery and Prosecution of new Markets; more safe to the industrious Adventurer; namely an *Insurance-Office* in one or more of these Colonies; which is the interesting of divers in the Loss or Profit of a Voyage, and is now become so much the Practice of *England*, that Insurance may be had in divers Cafes as well against the Hazards at Land, as Casualties at Sea, which must be acknowledged not only to be safe, but a great Encouragement to adventure; for it may so happen that a Person may sometime adventure his *all*, and then in case of a Loss he may be rendered uncapable of a future Trade, to the disadvantage of the publick, and (it may be) to the Ruin of himself * * * How far this may conduce to the Trade of this River, is obvious to any Man of Thought. Now whereas there has been some Attempts made at *Philadelphia*, which dropt and prov'd abortive, (for what Reasons we never could learn) we humbly propose to the Legislature that an Office be erected and supported by a Fund arising out of the Interest of the Loan-Office. This will be a good and safe Bottom, and cannot be easily overset by a few losses."

This is also said to have been the first essay on an abstract subject written and published on this side of the ocean, and to have been printed by Franklin.

It is always difficult to argue for any proposition which all admit to be true and against which nothing important can be said; for in such case the arguments advanced are necessarily obvious and trite.

Fire insurance business comes very close to being a public or a governmental function which the State allows corporations to carry on. In fact, each of us is *taxed* on all our combustible property in order to distribute over the mass of people a certain inevitable destruction by fire. It seems, therefore, to be quite proper that the State should concern itself with the methods of such a universal business—so far, at least, as the State can wisely interfere; for I am no believer, as a general thing, in State interference in the affairs of life. We are better when let alone. But in fire insurance practice there is much that the State can wisely do for us. *This clearly includes a State standardized fire policy.* Standardization is merely putting into permanent, concrete shape what we have worked out by experience and found to be useful. Why not crystallize *that much* and consider it as settled and pass on to the next problem? Intelligent insurance men ought not to have a moment's doubt, after all these years, as to the mere form of the policy. That, at least, they must have agreed upon, or agreed upon within the limits of an easy compromise of differences.

In railroad practice and in large manufactures, standardization is universal. It must be; any other method would not be profitable. There are too many problems to wrestle with and too much competition to permit men of affairs to waste time in anything less than perfect system, for, after all, standardization is but another name for system; just as habits are standardized conduct. Perhaps we could make the subject more attractive by changing the word and saying, let us systematize our business and thereby increase its efficiency.

There is another thought that seems to me to have value though it is not so often urged. It is a curious fact that while insurance companies as a class transact their business with conspicuous and constant fairness, there is a certain mistrust among their policyholders. I do not mean to say that I share that feeling—my attitude is one of entire confidence; but I believe the opposite attitude is common. And the reason for it is not difficult to grasp. It lies somewhat along these lines: Men, when they enter into ordinary written contracts, read them before signing, knowing that they will be bound by what they sign—read or unread. But it is a familiar remark, and it is true, that no one ever reads his insurance policy; he takes what he gets, puts it in his safe and never sees it again until a fire occurs. But yet, with a well-formed habit in his own business of entering into no contract until he has carefully read and clearly understands it, the insured who is given a contract, mostly in fine print, partly on the policy and partly on riders—some of it perhaps made with a rubber stamp and quite illegible—comes to doubt the fairness of the transaction; he feels that there may be something in the document antagonistic to his interest, covered up in a flood of words. He takes what he gets because he has no choice; but he does not like it—he feels that he runs a risk. And it is when he has had a loss and gets into a controversy in his adjustment that he comes to feel that there had been some advantage on the other side and that he had acted in ignorance.

I have just examined an ordinary fire policy on some farm buildings. The policy contains 4218 words. If read aloud at an ordinary rate, it would take fifteen minutes. To read and grasp its meaning would take a great deal more time than that, even for a trained business mind.

Now I understand quite well that the standard policy may not greatly shorten the policy. Perhaps it could be made to do so if careful lawyers addressed themselves to the task; for we lawyers are using fewer words than we formerly used. But admit that it cannot be made substantially shorter, my point is this: Let the State in its wisdom—and it ought to be the best wisdom and we will make it so some day soon—ordain a form of policy and require its use. Two results would flow from this. The insured, when he had once become familiar with the form, would never again have to concern himself about that part of it. He might have a hundred new policies every year; he would know that they were identical in legal effect. The State is his guaranty for that. Surely this would mean much to him in the way of confidence. The common feeling that I have referred to above, that in the mass of words in a policy some unfair, unread, unknown clause may creep in, would disappear; the humblest insurer would feel safe if he were told that the State was behind his interest; that there was no clause or provision in his policy for which the wisdom of the State was not fully responsible. This seems to me to be important; it means or helps to mean a "satisfied customer;" and we all know what a help to business that is. There would be no doubt or suspicion, only confidence and contentment. I hope not to be understood as having any doubt myself of the fairness of the business. Experience has long taught me differently. But I endeavor to point out a way in which confidence can be increased, and I submit that it is worth some trouble.

For these reasons, and others that are important, we can call upon the companies to come together for action in every State in giving the people a standard fire policy, uniform in all the States, on which alone throughout the Union insurance can be underwritten. Nothing less than this will suffice; there must not be the New York standard or the Massachusetts standard; we must have the National standard.

The time for action in this direction is ripe. Commissions have been appointed in nearly all the States which meet annually in the preparation and discussion of uniform laws on certain important subjects; and the State legislatures appear to be willing to pass the uniform acts which they recommend. There is now a uniform negotiable instruments act in force in almost every State; uniform acts on bills of lading, sales and warehouse receipts are being passed.

Here is a ready instrument at hand to secure a National uniform fire policy. It could be secured in two years if the companies would earnestly move in the matter. Such a movement, if sincere, would have back of it the force of the body of Uniform Law Commissioners and, indeed, of the entire membership of the American Bar Association, amounting to many thousands of lawyers throughout the entire country.

The passage through State legislatures of acts beneficial to business, not opposed by any selfish interest, has never seemed difficult to me. Twenty years ago, in the employment of the builders of locomotives and railway cars, I was able in a short time to secure the passage of a uniform car trust act in nearly thirty States in which such acts had not previously been passed. To do this work I never left my office; it was done entirely by correspondence, chiefly with active lawyers in different State capitals and without the expenditure of a dollar except for purely legal fees, and it really cost very little for that purpose.

NOTE.—The passage of the Uniform Bulk Sales Law—to prevent credit abuses—by the National Association of Credit Men, in more than forty States within recent years, lends emphasis to Mr. Rawle's views.—ED.

MR. EVANS: I have heard in a number of quarters from men of widely separated interests and experience the point of view that the administration of the fire commissioner's office in New York City has been largely political, and that the opinions emanating from that office measurably reflected that condition. I never had the pleasure of meeting Mr. Guerin before he came to this Convention last Monday morning; but my judgment, based on what I heard him say during this week, is that not only are his opinions based on real knowledge of the subject—real practical knowledge of the whole subject applied in the greatest State and most dangerous fire hazard city in the United States—but I am further convinced that his views, whether we agree with them or not, are based on an equally high and honest purpose. I merely want to pay this tribute to one gentleman who has been a whole week with us, working steadily about eight hours a day, because of some issues that have naturally come up in the conflict between men who entertain one set of experiences and views against men who hold an opposite point of view equally honestly, and perhaps mistakenly. We will now hear first from Mr. Guerin on the subject-matter of Section (b) of the suggested resolution.

"INSURANCE"—I

By Mr. Wm. Guerin, Acting Chief of Bureau of Fire Prevention, New York City

Fire insurance is the method of distributing the loss that occurs by fire among all those who pay premiums on fire insurance policies. The fire insurance companies are the means by which the funds are collected from the premiumpayers for the payment of the losses that occur. The fire insurance companies, therefore, are really the agency for the collection and distribution of the premiums paid in by the policyholders, less a reasonable return for services rendered. If ever a business was affected by a public interest that of fire insurance surely is, and this being the case it is a very proper subject of governmental regulation. The history of our government shows conclusively that it is patient with those corporations that are so necessary for public welfare and convenience. This statement applies more strongly to fire insurance matters than any other kind, for the State has interfered the least in the practical operations of the fire insurance companies. Until recently there was but little legislation on fire insurance matters, excepting the standard policy established by law in a few States in the Union. No doubt additional legislation concerning fire insurance would not have been necessary had the insurance companies of the United States conducted their business on the reasonable lines indicated by the practice of many fire insurance companies in the principal European countries.

The fire insurance business in the United States developed the fire insurance broker and his importance in insurance matters to such a degree that, coupled with the eagerness of the companies to outdo one another in obtaining business, the broker was placed in a position to nearly always dictate his own terms as to how the business of fire insurance should be conducted. It is a notorious fact that certain risks or lines would not be insured when presented to the company itself, but if again brought to the company by some powerful and influential broker the risk previously rejected would be insured. So notorious was this practice that it was a matter of common knowledge that companies would accept a certain proportion of bad risks to obtain from the brokers good risks. Like all abuses this thing continued to grow until it became a national disgrace, and the insurance companies that should have been the guardians of the public interest failed in their duty to protect the public from such vicious onslaughts. It was only a step from the issuing of insurance on risks that were physically hazardous to those that were morally hazardous. The records of the fire marshal's office, and the cases tried in the criminal courts in the city of New York, show the laxity exercised by the companies in ascertaining whether or not a moral hazard existed in the person and property of the insured.

All the foregoing facts were as well known to the men of the insurance world as it was to the fire department of the city of New York, but no movement emanated from the insurance interests to change the evil conditions. At the first rumbling of a public demand for reform in insurance methods, representatives of the insurance companies made a tender to reform the standard fire insurance policy, saying that it was somewhat antiquated and its parts not properly assembled, so that it was difficult for the layman to understand. While this was a proper and a good thing to do it was not one calculated to remedy the errors of insurance practices—which permitted the insurance business to develop into a gambling proposition whereby the companies wagered a thousand dollars against ten that the combined chances of accident, or criminal action on the part of the insured, would not result in the destruction of the property insured.

Fire insurance in a very broad sense represents credit. It is the credit of all those people who insure their property and pay the premiums therefor. The insurance companies are the credit men who are in honor bound to examine the character of those who are to benefit from this great foundation of credit. They are not merchants who buy and sell a product and who have exclusive title to the property that they have bought, for their business is so affected by a public interest that the police power of the State may justly step in and regulate its business in its every phase. In our form of government the State is always slow to exercise its police powers and rarely does so until an abuse has become so flagrant that the people turn their faces to the seat of government and cry out to it for the protection that can only be secured by State regulation and control. Such a condition has developed in the matter of fire insurance, and the people have called upon various States to exercise their powers to regulate the fire insurance industry. The most practical and conservative demand of this nature was presented to the legislature of the State of New York by Fire Commissioner Johnson as an amendment to the existing insurance laws. It reads as follows:

> Clause 1. Statements from insured.—No insurance corporation, association, partnership, Lloyds or individual underwriters authorized to do the business of fire insurance within this State shall make any contract of fire insurance on property located within a State to be in force and effect for more than seven days from the time of its delivery, or any agreement as to such contract, unless and until the applicant for such insurance, his duly authorized agent or representative, shall have signed and delivered to an officer, agent or representative of such insurer, an application in writing for such insurance which shall state, among such other things concerning which the insurer may desire to be informed—
>
> 1. The full name of the applicant, and if an individual his residence address;
> 2. The business, if any, of the applicant, and his business address;
> 3. The location of the property to be insured, with a general description of its character;
> 4. The reasonable value at the date of the application of the property to be insured;
> 5. The amount of insurance applied for;
> 6. Whether the property offered for insurance is already insured, and if so, for what amount or amounts with, if requested by the insurer, the name or names of the insurers writing such insurance;
> 7. Whether, so far as the applicant knows, any other insurer has ever declined to insure any of the applicant's property, or has refused to continue an existing insurance of the applicant, and if so, the name or names of such insurers;
> 8. Whether any fire has occurred within seven years in any premises occupied at the time of such fire by the applicant for residential or business purposes or both for which the applicant has received or claimed insurance indemnity and the details of all such fires, if any (for the purpose of this statement the word "premises" shall, if the applicant shall have occupied less than the entire premises, mean only such part thereof as the applicant actually occupied); and also unless and until an officer, agent or representative of the insurer or a broker holding a certificate of authority issued by the superintendent of insurance pursuant to the provisions of this chapter shall have certified to the insurer in writing that (1) he has examined such application; (2) he has examined or caused to be examined the property offered for insurance; and (3) he recommends the issue of the policy applied for, provided that the provisions of this section shall not apply to floating contracts of insurance, or agreements as to such contracts, on property while contained in bonded warehouses, general order stores, grain or other elevators,

or brick and stone storage warehouses or in transit in or on any streets, yards, wharves, piers, and bulkheads.

Whenever an application for insurance shall be delivered to an insurer pursuant to the provisions of this section such application shall be filed and preserved by the insurer so long as the insurance, in respect of which such application shall have been made, shall remain in force. Upon written demand of the fire commissioner of any city or the State fire marshals, every insurer shall deliver to said fire commissioner within five days a copy of any and all applications in his or its files for insurance upon property located within such city. Such demands, made by the fire commissioner, need not specify in any case the particular property in respect of which the applications for insurance are demanded, but shall be sufficient if they shall refer to all property in a particular locality described therein.

And no contract of fire insurance under this article on property located in any such city shall be avoided by reason of any fact, thing or condition existing at the time of the making of said contract unless the insured has made or caused to be made some false or fraudulent representation in regard thereto.

Clause 2. Penalties for violations of the preceding section.—Any insurance corporation, association, partnership, Lloyds or individual underwriter authorized to do the business of fire insurance within this State which shall make any contract of fire insurance on property located within a city of the State to be in force and effect for more than seven days from the time of its delivery, or any agreement to make such contract, before (1) the applicant for such insurance shall have signed and delivered the application in writing required by section one hundred and forty-nine (d) of this chapter, and (2) an officer, agent or representative of the insurer or a broker holding a certificate of authority issued by the superintendent of insurance pursuant to the provisions of this chapter, shall have made and delivered the certificate required by the provisions of section one hundred and forty-nine (d), shall forfeit to the people of the State of New York the sum of one thousand dollars for each such contract or agreement to make such contract so made, recoverable by the superintendent of insurance in any court of competent jurisdiction.

Any officer, agent or representative of any insurance corporation, association, partnership, Lloyds or of any individual underwriter authorized to do the business of fire insurance within this State who on behalf of such insurer shall make any contract of fire insurance on property located within any such city or within the State to be in force and effect for more than seven days from the time of its delivery, or any agreement to make such contract before (1) the applicant for such insurance shall have signed and delivered the application required by section one hundred and forty-nine (d) of this chapter, and (2) an officer, agent or representative of the insurer or a broker holding a certificate of authority issued by the superintendent of insurance pursuant to the provisions of this chapter, shall have made and delivered the certificate required by section one hundred and forty-nine (d), shall be guilty of a misdemeanor.

This act shall take effect immediately.

This measure was passed by the Assembly of the State of New York, but owing to the lateness of the session it failed to pass the Senate.

The standard uniform fire insurance policy does not operate to prevent arson, but rather acts as a protection to the company after the crime of arson has been committed. The companies alone are not interested in this contract of fire insurance. The individual and the State likewise have an interest in it, and like all other contracts between individuals in which the State has an interest, the protection for the individual is secondary to the welfare of the State. Therefore it is no presumption on the part of the State to demand that in fire insurance contracts its interests will be conserved as well if not better than the interests of the insurer. If the standard policy would make the conditions for the insured a little more difficult before obtaining insurance, and a little less difficult after he has had his fire, it would almost eliminate the moral hazard of insurance and facilitate the payment of honest losses.

There has been recently enacted in the State of New York a law giving control to the State Department of Insurance over all insurance brokers and adjusters, with plenary powers as to the issuing of licenses to conduct the business of fire insurance or brokerage, and to revoke such license for cause. This measure, although but a few months in force, is showing good results. It is expected that it will either eliminate or restrain brokers and adjusters who do not conduct their business in a proper manner.

It is earnestly recommended that the representatives of the various cities and States of the Union attending this Convention take up this matter concerning the regulation of fire insurance companies in the issuing of policies, to the end that they be compelled to make proper investigation of the character of the insured and to inspect the property on which insurance is sought.

The need of such regulation was well illustrated when representatives of the Bureau of Fire Prevention of the city of New York obtained insurance to the extent of $127,500 on $3.96 worth of household furniture, and this in what was known as the "Firebug Zone," where the rates had been increased from $2 per thousand on household furniture to $10 per thousand, on account of the moral hazard only.

MR. EVANS: The next paper on section (b) of the suggested resolution will be given us by a gentleman who is charged with the high duty of caring for fire waste control throughout the State of Pennsylvania. It gives me great pleasure to introduce Mr. Joseph S. Baldwin, of Harrisburg, Pa.

"INSURANCE"—II

By Mr. Joseph S. Baldwin, Fire Marshal, State of Pennsylvania

To those devoting their entire time and energy to investigating the reasons for the enormous fire waste throughout the United States, as compared with that of European countries, it is very apparent that the inefficiency of the laws governing fire insurance companies and their agents is in a great measure responsible for this stupendous and unnecessary waste. As a remedy to effectually reduce this waste there should be enacted by the various State legislatures a law, with sufficiently heavy penalties attached for non-compliance as to make compliance certain, prohibiting the issuing of any contract of insurance or agreements as to such contracts before a written application shall have been signed by the applicant and certified to by the agent of the company to which application is made, after the agent has made a thorough inspection of the property offered for insurance and has examined into the character and standing of the applicant, the application to be attached to and become a part of the policy when issued.

It is expected that the effort to have such a law enacted will meet with strong opposition on the part of the insurance companies, notwithstanding the fact that the purpose of the law is not to deprive the insurance companies of business but rather to increase their business, with an assurance of a higher character of risks; the reduction of overinsurance, which is an inducement to the incendiary; and the elimination of worthless risks, which are costing thousands of dollars annually in losses, the burden of such losses falling on the insured of high-grade risks; and finally effect a decrease in premium charges. European countries require such applications and, as a consequence, incendiarism is rare and the fire waste about one-tenth of what it is in the United States.

Applications should be so drawn as to provide for the covering of insurable property of all kinds, and should provide for the provisional insuring of goods for a limited period, pending the filing of an application. A draft of an application blank is herewith submitted for publicaton in the report of this Convention, covering the application for insurance, a proviso for provisional insurance pending an acceptance and delivery of policy, and the certification of agent, and prescribing penalties for non-compliance with the law. Briefly, the application covers the name of company to which application is made; name and address of applicant, specifying whether an individual, copartnership, stock company or corporation, and, if any of the last three, the name, address and title of the person signing the application; kind of business; location; value of property; amount of insurance applied for; whether insurance is to cover machinery, stock, fixtures or household furniture, and the value of the same, the amount of insurance desired being given separately; also whether at the time of the application there is other insurance on the property and, if so, the name of the company or companies issuing the policies and the amount in each company; also whether insurance has ever been refused to applicant on any property, real or personal, and the amount applied for and name of company (the answering of this question means much to the legitimate insuring public and will probably be the means of ending overinsurance or the issuing of policies to undesirable applicants by one company where the same has been refused by another company); also whether at any time the applicant has had policies canceled, reasons for same and name of company and amount or amounts; it also requires the business address of the applicant and length of time in which he has been in business; also whether he has been engaged in business in any other location. Questions 13, 14 and 15 are important questions covering the fact as to whether the applicant has failed in business, been declared a bankrupt, or suffered loss by fire, and if so, when and where. These questions should in no way offend honest insurers and are not intended as a reflection upon such, but are for the sole purpose of depriving of insurance those who frequently move from place to place, starting in business anew and leaving behind them a history of failure, bankruptcy, or fires, the latter owing to the ease of obtaining overinsurance. The application blank also provides that the agent shall examine the application and certify as to the condition and value of the property, character and standing of the applicant, and any reasons ascertainable why insurance should not be granted, or recommend the granting of the insurance applied for. Under certain conditions the application provides that contracts or agreements of insurance may be entered into for a period not exceeding 72 hours to cover any increase in stock of merchandise of any public service corporation, store, warehouse or manufactory, and lastly provides penalties for failure to comply with any of the provisions of the law as covered in the application.

It is a well-established fact that many insurance agents depending on commissions for obtaining insurance are alive to every opportunity to increase their income, and the character and standing of an applicant or the condition of property to be insured or amount of insurance already on the property does not enter into the consideration. They are after such business as will add to their income, regardless of the risk, and canvass assiduously, attempting to place as many policies as possible. Agents increase their activities in the neighborhood in which fires occur. The action of these agents in urging insurance to unscrupulous persons may result not only in loss of property but in life itself, and in the increase of insurance rates. This is an unjust hardship upon all honest persons requiring insurance on their properties and affects the business standing of a community. At times, companies ostensibly decline risks, but the insurance can be obtained from these same companies through favored agents or brokers. Some brokers and agents do not hesitate to apply for thousands of dollars of insurance on property of little or no value for the sake of obtaining their commissions. It has also been found that adjusters of questionable character haunt fires and endeavor to obtain contracts from the insured for adjusting losses. These adjusters are allowed to take a percentage of the total loss paid by a company, so it is to their interest to manipulate the inventory so as to make the loss as high as possible.

In the interest of the insuring public and with the object of reducing the fire waste and premium rates there should be enacted in every State laws licensing agents, brokers and adjusters. Such laws should be of such restrictive nature as to positively prohibit the obtaining of insurance for the sole purpose of obtaining commissions and the position of adjuster should be made of such a public character that both the insured and the company would receive fair and honest treatment. Severe penalties should be provided for failure of either agent, broker or adjuster to comply with the law and the insurance commissioner or the State fire marshal should be empowered to cancel policies in suspicious cases, or where the insurance is above the actual value of property insured. He should also be empowered to revoke licenses of dishonest agents, brokers or adjusters; and a black-list of all undesirable applicants or of agents, brokers or adjusters should be kept in the office of the insurance commissioner or State fire marshal, which should be accessible at all times for the use of insurance companies or others interested.

To quote from the president of one of the largest insurance companies: "If every fire is a crime against the State, it follows that every fire must be investigated by public officials before losses are paid, and when this point is reached our fire waste will cease to be a National scandal, for which insurance companies are responsible with a dishonest and careless portion of the people.

"The company that fosters incendiarism by liberal payment of crooked losses, and the local agent who works hand in hand with the firebug by issuing policies without investigating, are both a danger to the State, and in the interest of public policy should have their licenses revoked."

APPLICATION

That it shall be unlawful for any corporation or association, domestic or foreign, incorporated or authorized to engage in the business of fire insurance in the State of......................to make any contract of fire insurance on property located within this State, to be in force and effect for more than seventy-two hours, from the time of its delivery, or any agreements as to such contract unless and until the applicant for such insurance, his duly authorized agent or representative, shall have signed and delivered to an officer, agent, solicitor or representative of such insurance company or fire insurance broker, holding a certificate of authority as such issued by the insurance commissioner of......... ...., an application in writing for such insurance, which application shall be attached to and form part of said policy, and a copy of same shall be delivered by such insurance company, its authorized agent or representative or fire insurance broker, to the State fire marshal at....................and shall be in the following form:

This application must be filled out in ink

Number...........

Full written replies must be given to each question. A stroke of the pen will not be accepted as a reply.

pplication for insurances to the (Name of company)..........................

1. Name (in full) of applicant ....
Address ....

2. If a copartnership, joint stock company or corporation, give the name and le of person signing this application ....
Address ....

3. If in business state what kind..

4. Give name of owner and location of building..........................

5. If insurance on building is applied for, give value thereof and amount of surance desired.

Value of building $......................................
Insurance applied for $..................................

6. If insurance is applied for on machinery, stock, fixtures, or household rniture, give value of each separately and amount of insurance desired.

Machinery.................... $........................value
$........................insurance
Stock ....$........................value
$........................insurance
Fixtures...................... $........................value
$........................insurance
Household furniture........... $........................value
$........................insurance

7. Have you any other insurance upon property mentioned in the application? Yes or no....... If so, how much $..

8. Give name of company or companies and amount of insurance issued by each.

Name of company........................Amount $...............
Name of company........................Amount $...............
Name of company........................Amount $...............
Name of company........................Amount $...............

9. Have you ever been refused insurance upon any property real or personal? ....

10. If refused insurance, give name of company refusing same............... Amount $...........and reason for refusal....................................

11. Have you ever had a policy cancelled..........If so, for what reason.... ....Give name of Company............................. Amount $...........

12. What business are you in?

Business ....
Address ....
Length of time...

If at any other place give time and location...................................

13. Have you ever failed in business?............If so, state when and where? (Yes or no) ....

14. Have you ever been declared a bankrupt? (Yes or no).............If so, state when and where..

15. Have you ever suffered loss by fire? (Yes or no)...................... Where ....Amount of loss..................Was settlement made by the companies in which you were insured? (Yes or no)........

I declare that the above answers are full and true.

Dated at..........................the ....day of..................

Name in full ....
(Applicant for insurance)
Witness ....

And also unless and until an officer, agent or representative of such insurance company, or fire insurance broker holding a certificate of authority as such issued by the insurance commissioner of..........................shall have certified in writing, that (1) he has examined such applicant; (2) he has examined or caused to be examined the property offered for insurance; and (3) he recommends the issue of the policy applied for, which certificate shall be attached to and form part of said policy and a copy of same shall be delivered by such insurance company, its duly authorized agent or representative or insurance broker, to the State fire marshal...........................and shall be in the following form:

(*Certificate to be filled out in ink by the local agent.*)

1. Have you examined the foregoing application of......................?
2. Have you examined or caused to be examined the property on which insurance is applied for and into the condition of the same? (Yes or no)............. If so, state condition and value of same....................$............value.
3. Have you any reason to believe that the value of the said property is not as great as the amount fixed by the applicant in the foregoing application..........
4. Did you inquire into the applicant's character and standing in the community in which he lives?........................If so, what is the result of your investigation? ....
5. Do you know of any reason why the insurance applied for should not be granted? ....
6. Are you aware of any circumstances not disclosed above which might have an unfavorable bearing upon the desirability of the risk? ....
7. Do you recommend the granting of insurance applied for?.................

REMARKS

....
....

I certify that my answers to the foregoing questions are full and true.

Agent........................
Witness......................

Witness ....

Provided, however, That contracts of fire insurance or agreements as to such contracts may be entered into for a period not exceeding seventy-two (72) hours to cover any increase in the stock of merchandise of any public service corporation, store, warehouse or manufactory, upon the presentation, by the owner, of such merchandise or his representative to a duly authorized officer, agent or representative of the company or companies making such contract, or to any fire insurance broker holding a certificate of authority as such issued by the insurance commissioner of............................of a bona fide invoice of bill of lading from the shipper of any such merchandise, and a copy of said invoice or bill of lading shall be attached to and made part of such contract and notification thereof, shall be delivered by such insurance company, its agent or representative or insurance broker, to the State fire marshal at ....which shall contain the name of the insured, the date of the contract or agreement, the value of such merchandise and the amount of insurance issued thereon.

Any insurance company which shall make any contract of fire insurance, to be in force and effect for more than seventy-two (72) hours from the time of its delivery, or any agreement to make such contract before (1) the applicant for such insurance, or his duly authorized agent or representative, shall have signed and delivered the application in writing or the invoice or bill of lading required, and (2) an officer, agent or representative of the company making such contract or broker holding a certificate of authority as such issued by the commissioner of insurance of........................shall have made the certificate required, shall forfeit and pay into the State treasury of...................the sum of one thousand dollars ($1000) for every such contract or agreement to make such contract so made, to be recovered at the suit of the........................as other debts are, by law, recoverable, and in addition thereto any officer, agent or representative of any insurance company, or any broker holding a certificate of authority as such, issued by the insurance commissioner of........................who shall make any contract of fire insurance contrary to the provisions hereto set forth, shall be guilty of a misdemeanor and upon conviction be sentenced to pay a fine of not less than........................dollars ($...........) nor more than ....dollars ($...........), or undergo an imprisonment not exceeding..........................or either or both, at the discretion of the court.

Any person or persons who shall fraudulently make, sign, alter or utter or be concerned in the fraudulent making, signing, altering or uttering any false or misleading application for fire insurance or any invoice or bill of lading required, by the provisions hereto set forth, shall be guilty of a misdemeanor and upon conviction shall be sentenced to pay a fine not exceeding..................... dollars or undergo an imprisonment by separate and solitary confinement at labor nor exceeding ....or either or both at the discretion of the court.

MR. EVANS: I am satisfied that there is a growing sentiment throughout the country in favor of a uniform fire insurance policy contract. Mr. Emmet, the head of the Insurance Department of the State of New York, has written me very clearly his views and purposes to this end with respect to the Empire State, and a number of other States are moving similarly in the matter. It seems to me some combined effort to expedite agreement between all parties concerned on this very important subject would be to their best interest. I received a letter a couple of years ago from the manager of the insurance department of one of the largest brewing concerns in the West, in which he stated that in the fire insurance protection of their business (to cover their large plants first, and then all their associated business interests scattered over a wide range of States with a large number of properties involved) it seemed an endless lot of complexity to get adequate real contracts. He thought it almost impossible, even with his experience, to get substantial protection. I believe further that this growing sentiment will convert itself into action, not altogether wise when it comes, unless the best minds among the buyers as well as the sellers of insurance get together and produce a simpler and more understandable and clearer-to-the-people fire insurance contract all over the United States.

The following letter on this subject from Mr. Terry hardly seems to have fully answered the need of the case, or the wise or permissible course of action to correct the situation:

CONFERENCE OF COMMISSIONERS ON UNIFORM STATE LAWS
Charles Thaddeus Terry, President
100 Broadway, N. Y. City, October 20, 1913

MR. POWELL EVANS
Chairman Fire Prevention Commission
Dept. of Public Safety, City Hall, Philadelphia, Pa.

MY DEAR MR. EVANS: Referring further to your communication to me under date of August 21st, permit me to call your attention to the fact that it does not fall within the province of the conference of Commissioners on Uniform State Laws to take up any subject which is not of the character which would make a conflict of the laws of the various States result in particular injury or confusion or complexity of relation as between the citizens of the various States. In other words, the province of the Conference is to deal with subjects of interstate concern and application rather than subjects of intrastate concern and application. We are very much pressed with many subjects falling fairly within the jurisdiction of the conference, and while we should like to take up, and many of us are greatly interested in other subjects—as for example, the work upon which you are engaged—I am far from feeling that it would fall within the province of the conference as above described.

I should be glad to have your views on this subject, and meanwhile, I remain, with cordial regards and congratulations upon the excellent work which you are doing in connection with fire prevention,

Very faithfully yours,
CHARLES THADDEUS TERRY

NOTE: The following, reported in a daily paper subsequent to the Convention, is a timely item!

FEDERAL CONTROL OF INSURANCE IS URGED

President Darwin P. Kingsley, of the New York Life Insurance Company, has sent out letters presenting to the presidents of all life, fire, accident insurance and surety companies engaged in interstate business the necessity for supporting a movement to secure a constitutional amendment to have insurance between States specifically declared "interstate commerce."

Interstate insurance would thus become a subject of Federal rather than individual State regulation and taxation. President Kingsley suggests the formation of a proper organization to forward the adoption of such an amendment and asks the executives to signify their willingness or unwillingness to join.

"A situation exists in Washington," he says, "which calls, it seems to me, for quick recognition and united action by the executive heads of those insurance companies who believe in Federal supervision of insurance. A joint resolution is pending, introduced in the House by Mr. Peters and in the Senate by Senator Weeks, both of Massachusetts, providing for the submission to the various States of a constitutional amendment declaring specifically that the business of insurance between the States is commerce. This resolution was not introduced at my suggestion or with my knowledge.

"It seems probable, in the light of our recent Deer Lodge county (Montana) decision, that we shall never reach the condition that some of us seek by any shorter or surer process than a constitutional amendment.

"That interstate insurance shall be declared commerce seems to me to be rather the most important achievement for which we can strive in administration. I believe that such an amendment will ultimately be adopted. I am anxious to unite with all other executives who feel as I do in some fair and proper programme which will advance the passage of this joint resolution."

MR. RYON: It may be a matter of information to some of you that the question dealt with by Mr. Rawle is and has been for some months the subject of consideration by a committee of the State Insurance Commissioners of the United States. It is agreed, I think, on all hands that the standardization of insurance contracts in all of the States is desirable. But there are some practical difficulties in arriving at an agreement on that subject. First, because we now have standard forms effective by law in States like New York, Massachusetts, Minnesota, Wisconsin, Nebraska and some others, and they are not altogether applicable, although there is no reason why they should not be so. It is true that the New York standard form, which perhaps is the precedent used by all the other States, is now susceptible to amendment to the advantage of the insuring public and the insurance companies. To that end the State Insurance Commissioner and the National Board of Fire Underwriters in their meeting at Spokane appointed a committee of five to confer with the insurance companies and see if an agreement could not be reached which would simplify the standard form and present, as they will do very shortly, before the convening of the next Legislature of the State of Washington, a report which might be used in all of the States so far as they could be induced to adopt it, so that finally we might in all of the States have a standard form. I am advised by the commissioners' committee, as well as by the committee of the National Fire Protection Association, that they are making progress, and that the report will shortly be produced. It is hoped, I assure you, by the insurance companies as well as by the commissioners representing the people of those States, that when that report is produced it will be generally satisfactory and likely to be adopted. I am sure the insurance companies are as heartily in favor of the provision of the standard form as you gentlemen and the States you represent.

There is another movement of similar character, and in a way it is a very important one. It was begun at the recent meeting of the National Convention of Insurance Commissioners, held in July and the first days of August of this year, at Burlington, Vermont. Most of you know of it. Indeed, all of you with State legislatures have considered the conditions existing in their States warranted them in interfering—in some cases taking the rate making out of the hands of the companies and assuming it by the State (Texas, perhaps, being the only example where that has been entirely accomplished by law). This question of fire rates in relation to fire insurance business and the public has been so emphasized recently that the insurance commissioners' body, feeling that they represented the public (and I think they fairly do in most instances), decided to appoint a special committee for the purpose of going into all of these questions which affect the business of fire insurance and its relation to the insuring public; and to that end we adopted a very comprehensive resolution at the Burlington meeting and appointed a committee of nine insurance commissioners. They held a preliminary meeting last week. I was present at the meeting and heard their purposes and an outline of the work they intended to do. Since I came here Mr. Ekern sent me a copy of the outline and plan of their work and it is very comprehensive in its scope, embracing all these questions so far as fire insurance is concerned that you have discussed at this meeting during the week.

Invitations will be sent by the chairman to the insurance people, the manufacturers' associations, to commercial clubs, and to all of the interests affected. An opportunity will be given at the meeting for the fullest discussion of all these problems which really affect fire insurance to the insurers. I don't think anything taken hold of by the fire insurance officers will be productive of more comprehensive or widespread results than this investigation by fire commissioners. And it has run through my mind that it is entirely in harmony with the purposes of your meeting. I think it is very likely that some of you here are not aware that a movement of this kind has been inaugurated by the supervising officers, and the character and scope of it.

MR. EVANS: Mr. Ryon's remarks are very much to the point. They have due authority because of the fact that he speaks directly the viewpoint of the insurance interests, and comes here frankly as the principal counsel of the National Board of Fire Underwriters.

MR. LINDBACK (Manitoba): In our country even the best insurance companies employ irresponsible parties as solicitors; that is, men who haven't any interest but simply to get as much commission as possible. In taking this up with a leading insurance man in Winnipeg the suggestion was made that perhaps the licensing of insurance solicitors would to a certain extent remedy this matter. I had a little example. I was standing on the street talking with a friend, an insurance man, when a man came up I happened to know, and whom I considered only lived from hand to mouth and wanted to get easy money. While I was talking my friend said: "I must get home, as I have an application I want to fill out and act upon." This second party said: "Let me have that. I know a party or two who I think can get that insurance, and I will make that much money." We went away from the latter and I said: "Do you allow a man like that to solicit for you?" He said: "Oh, we don't mind so long as we can let him make a little money."

I had another case where a farmer, who couldn't speak English, had a little store and got insurance for $1500 on the contents of that store. He had a fire. When the fire was reported to me the first thing I demanded was a full record of his stock. The first record he brought was $300. "Well," I told him, "with $300 actual value and $1500 insurance, it will be hard for you to collect any money." Finally it became necessary for me to look over that stock. It seemed he had two fires. Behind one counter was tobacco and behind another counter was nothing, and fire occurred behind both counters. I got hold of the company who wrote that insurance. The manager was a good friend of mine, and he said: "Johnson, our best solicitor, took out that insurance." Johnson came up and I asked him how he came to put $1500 worth of insurance on that stock. He said: "Of course there was not that much; but the grocer said he was going to put in some more stock and I insured him on that basis—$1500." The grocer was an absolute incendiary. I couldn't prove it, however. I was finally informed that the manager in Montreal thought it better to compromise with the fellow and settle. That is the kind of thing we are up against. If we can get laws first that will make it obligatory on the insurance companies not to engage any solicitor who is not conscientious in his work, it will help this matter greatly. Some of the States having fire marshals prohibit the payment of loss until investigated by the fire marshal. We don't have such a law in Manitoba, but I have personally, with my power, held up settlement until full investigation has been made. In several cases I have prevented insurance from being paid, and I am now trying to get Parliament to make a fire act to hold up any loss—or rather payment of loss—until fully investigated. That, of course, brings a great deal of power into the fire division; but that is what we are there for. I have given a great deal of attention to this question of fire insurance, and have taken it up with insurance companies again and again, and I will use any means in my power by which I can arrive at some proper solution of the problem.

Mr. Goddard: It seems to me the papers and the discussion here this morning have strongly emphasized the fact that this gathering is of a somewhat unique nature, namely—that a large number of men more or less prominent in their respective lines—and these very diversified—have come together, and that they are all earnestly working (and I believe without exception honestly) toward the same end of reducing existing fire waste. Differences of opinion have developed; but every action taken by this Convention (I think I am within bounds in saying that) has been unanimous so far. I think it has been considerably to the credit of whoever planned the outline of the program that with two exceptions that unanimous action has been the same as outlined in the program; and that in these two cases committees composed of men who have apparently widely differed on the floor of the Convention got together, and in that spirit of compromise and earnestness which should characterize any convention of this sort, and without long, interminable wrangles (but in two of the most pleasant meetings of the character in which it has ever been my privilege to participate) were able to bring into this Convention not only a unanimous report but one which received the unanimous support of the Convention—in both cases practically without further discussion. Those two reports were not exactly in the wording of the resolution as originally presented. I think we all must agree, however, that in both cases the spirit of the resolutions and some of the details were incorporated in the committee reports. With such a record for the past five days, I don't believe that there will be a great deal of difficulty in carrying that record right along through the Convention and establishing a record of unanimity of action which is the only one that will carry conviction to the public. No resolution adopted by a convention of this nature and closely contested, or contested with any reasonable minority on either side, can carry the conviction that a unanimous, hearty endorsement always carries. We have before us this morning a resolution which I think every member here fully endorses as to its objects and spirit. As to some of the details, there is probably some difference of opinion. It is quite an important resolution and I believe with Mr. Guerin that when properly solved it will produce a very decided and beneficial effect. Now it rests with us to reach the proper solution as to the action of this Convention.

Mr. Ryon has told us that the men appointed by the States to regulate, so far as the State has power, and to secure legislation which to them seems necessary to further increase that power, are at work in a very similar line. That I know; and if I may judge the caliber of the men who are engaged in that work from the caliber of the men in like offices in the New England States with whom I am familiar, and especially in Massachusetts whom I know best of all, the solution which they may reach will be a long step in the direction of true progress. I am inclined to think that we can pretty safely trust them to arrive at that solution if we put before them the ideas and suggestions that have been brought out at this meeting; and I am inclined to think possibly the most effective course that this Convention could possibly take would be something along that line. In the program which governs this Convention we have a subject which has not yet been definitely considered. It comes up next. We also have some correspondence between the Chairman of this Convention and the National Fire Protection Association; and Mr. Evans in that correspondence quotes from a resolution adopted by the Executive Committee of the National Fire Protection Association, reading as follows:

> "Regarding the suggestion bearing on the subject of legislation and publicity we recommend the appointment of a general committee on this subject to be known as the Committee on Public Information, with sub-committees in various States and provinces to work under the direction of the general committee, of which the general secretary of the association shall be Chairman."

That covers the suggestion bearing on the subject of legislation and publicity. That committee has been organized (there was a meeting this week in this city) and has started a broader line of work for the National Fire Protection Association which the Chairman of this Convention has urged on the Association. I think he deserves great credit for suggesting to the National Fire Protection Association that it take full advantage of its opportunities. I recently heard a story in point about the Ford automobile—that is, that they had such a demand for their automobiles that they averaged a sale every two and a half minutes. A man got up on the floor of the meeting and said in reply to the representative of the Ford Company who made this statement: "I want to say that the Ford Company is not making full use of its opportunities, for there is a fool born every minute."

In the interest of harmony and of carrying out the record of this Convention with unanimous action, I earnestly and honestly advocate the spirit and objects of every paper that has been read this morning and every word said this morning, and I want to offer the following resolution—

MR. EVANS: Mr. Goddard, may I interrupt you for a second? If you will permit a suggestion, before you decide to offer a resolution it might cover a slightly different procedure and still satisfy your purpose. My thought, from the tenor of your remarks, is that you would like to see anything that is done here carried out with exceeding care; but I hope to have ***some positive conclusion reached on every one of these items;*** and if it would be agreeable (without your proposing a resolution) for me to appoint a committee of five—Messrs. Lindback, Guerin, Baldwin, Mr. Ryon and yourself—to think this over and bring in a report in an hour, I would like to take that course. In the meantime we could go ahead with other business.

MR. GODDARD: I am perfectly willing that you adopt that course. I will present this resolution to the committee and whatever we decide on will be eminently satisfactory.

Mr. Hexamer: I move that the suggestion of the Chair be the sense of this meeting.

Mr. Goddard: I second the motion—that the Chair appoint a committee of five to confer on this matter and report within an hour. Motion carried and committee appointed as named.

Mr. Evans: I want to bring up something at this time germane to all these matters—an important consideration although not formally in line with the next topic on Organization. It should be made quite clear that the Record of this Convention will be exactly what is said here —not in absolute stenographic detail, but in effect—so as to produce a faithful story. The matter of this Record is important. I will give you a frank statement of the whole affair. When this Convention was first conceived by me I proposed it to the Fire Prevention Commission and it approved, but had no means to carry it out. The reply was, "Godspeed; but you must arrange to finance it." With that step taken I conferred with the Director of Public Safety, who expressed the same interest but with the same limitation. He said: "It is a fine thing to do —using your work here as an illustration of what can be done in other States and cities which have not already done it; but we have no money for it." I then determined to carry out the Convention myself.

The question that then arose was: "If this Convention proves a success and in anyway contributes to the substance or form of the knowledge on the subject, how can it be useful in its largest possible way?"—because one of the main reasons for this Convention was to get the knowledge that exists on the subject all over the country out to the people right; and you can't get knowledge out by continuing to discuss it in a small circle and leaving it bottled up in that circle. The thought then was that if we made a success of this Convention a great number of books—incorporating its proceedings, papers and discussions—should be distributed to those who need the data and who can use it to advantage.

There are 3000 libraries in this country in round numbers; and within the last year or two I have received a constant dribble of requests for the pamphlet I wrote on the subject of "Fire Waste." Not that it was any particular tribute to the pamphlet but it merely showed a desire on the part of libraries to get on their shelves something that gave light on this problem. I have had constant like requests from city and State officials scattered over the country, constituting another group who, if they do not ask for such data, certainly ought to and could use it to advantage. There has also been continued like inquiry from trade associations. All told, there is a host of appropriate people who ought to have the Record of this Convention and could use it to great advantage, consisting of, first, 3000 libraries; second, 1000 cities and towns and State offices (with the head of the fire-fighting force, building inspection force, water supply force and fire prevention bureau force, or four men in each case) which accounts for 5000 more; and, third, trade associations (and you would be surprised at the number of these—something like 5000 in cities in organized form, and 5000 more in the rural communities, everyone of which should have this Record), making 10,000 more. That makes 18,000. How are we to get 20,000 or more of these books printed? The Record will probably take 400 pages of a book 6 x 9 inches and should be bound properly. How raise this money? I have found that by getting 25,000 of these books printed on decent paper, with paper backs, the cost would be about 30 cents, not including envelopes or mailing.

My first plan in this connection was to make a flat-footed statement to that effect—that if this work here for a week meant anything it meant action; and if action meant anything it meant money would be spent in bettering the construction, protection, equipment, etc., of property to better the fire hazard of life and property all over this country and Canada; and this work would be done and the money spent among those people in the aggregate engaged in business in this field. There is nothing obscure or unreasonable in that position. I wrote 1000 people among the trades so interested last spring and told them on the letterheads of my firm (which has been in existence for 50 years in a decent way, and to satisfy the many who didn't know me I gave as references five important National banks in New York, Chicago and Philadelphia) that I needed money for this purpose—not exceeding $200 from any one source—first, to pay the raw expenses of this Convention; second, to get this Record out—25,000 copies at cost; and third, that any residue would be put in a trust fund for this cause. In answer to this 1000 letters I received two replies and about $150 or $200. The above proposal did not include advertising in any form whatever, and was found unworkable.

Toward the end of August I moved in the matter again and outlined a *quid pro quo* in some concrete form. I put out a second proposition, based on ordinary periodical distribution. Advertising in an ordinary periodical is worth half a cent a page per book, and, based on an issue of 25,000 books, a schedule was adopted of $75 per half page and $125 per page, with a maximum of $400 as the limit anyone could take, and all advertisements to be carefully scrutinized. Agents of many firms came to me asking if they would be permitted to read papers about their peculiar products. My uniform answer was: "This is a meeting to discuss general principles and practices, and no personal interest whatever can be introduced in it at any price or at any time." To date about $1500 in contracts is the gross result of all effort in this direction, by means of at least four series of communications and many personal calls, at an actual cost of about $500.

Now, gentlemen, we have a message here—a good one, a strong one and a dignified one—and there should be some way found to get this out to the public without one man having to do it all. Yesterday the fire marshal of South Dakota and the insurance commissioner of Virginia both spoke to me of their own volition and said: "Our office wants to pay some of this expense and help you distribute this Record throughout the country." The purchase of these books will give me the help needed, and these books will tell the public the truth about fire waste from every angle and at very little cost. We have more here than ever before, and it is up to date. I therefore submit the thought that if every State fire marshal and insurance commissioner will write me a letter telling me his opinion of this work and its worth, and give me an order for as many books as his department will distribute; and every city fire chief, chief of a bureau of building inspection, water department chief; and every board of trade and every labor and civic association in the country would do something, we might get out many thousands of these books very cheaply and beneficially. I will guarantee that they will be edited and sent out in good form.

MR. RYON: I presume that within the next thirty days I will have an opportunity to meet more individuals representing municipal and civic bodies than anyone else in this room. On the 10th of November I shall have occasion to meet with the Committee of Nine Insurance Commissioners, and it will give me a great deal of pleasure to present to them the considerations that you have mentioned, together with my personal view of the work of this Convention, and to recommend that so far as their appropriations will allow they order such number of copies as can be used in their several States. I will take this matter up in Chicago with Mr. McDonnell, the head of the Department of Public Safety there, and will recommend that the city of Chicago buy as many copies as can be used—and the Lord knows they need a lot of them! They need them worse than you do in New York, Mr. Guerin. If this gospel is expressed as it should be, and is known in Chicago as it is known to us here (I speak entirely selfishly just now), the fire insurance companies I represent would make so much money in Chicago they would have to reduce rates right away.

I don't know what the National Board of Fire Underwriters will do, but I shall recommend within a few days that they take as many copies as we can use through our agencies. It seems to me almost a crime if the results of this week's work should be lost to the people of the United States and Canada. It must be done! No matter what the private interests or individual notions may be, we are all agreed upon one proposition, and that is the fire waste is needlessly large in this country, and this is one of the means of propaganda. Within the next thirty days I shall have opportunity to recommend that all order from the Chairman such copies as they can use.

MR. GUERIN: Owing to the peculiar laws governing New York City and State, the city itself may not (or may find it difficult to) purchase these books; but what I propose doing, and ask every member of this Convention to do, is to copy the activity of some of our religious people—go right down to the boards of trade and other organizations of a similar kind, and impress them with the fact that it is their duty to distribute the Record of this Convention as widely as practicable among their members and citizens generally. I feel satisfied everybody can help in that manner, and I at least propose to do it.

MR. BALDWIN: I assure you the Pennsylvania State fire marshals will purchase their share of the books. We have 2500 assistants and will provide everyone, as well as a large number outside.

MR. EVANS: Thank you all. As soon as we got in motion here nearly every speaker received requests for copies of his address. I wrote or told each speaker that in view of the proposal to sell advertising to pay expenses we were committed to putting this Record out as an original document; and asked them to impound their papers for our exclusive use, and to this all agreed. I have since been told that there might be a measure of attack on me in certain technical papers because of this course of action, hence I wish to make clear to you the genesis of this action.

MR. WENTWORTH: You realize that among the 2500 members of the National Fire Protection Association there are only a few present, but I am sure a large proportion of those members desire to know and have the transactions of this meeting, and to know what occurred here; and I think we may reasonably expect a good number of orders from our members. We may issue some sort of circular on the subject to our members.

MR. EVANS: Thank you, Mr. Wentworth. My thought is, finally, that if I can get you gentlemen who have come here throughout the week (many have been here who are not in attendance this morning) to send me such expressions as you see fit about the value of these proceedings, and your sentiments on the proposal to get it out in large numbers—a complete story—I will boil them down into a pamphlet, and circularize groups of State and city officials, trade associations, etc., for orders in advance, as I cannot contract for a large issue of the books until I get actual orders in hand. Please do any solicitation you please in this matter and get anybody else to understand the situation, and you will do this whole cause a great benefit.

MR RYON: Is it your idea to produce this edition without advertising?

MR. EVANS: Certainly—without a single line if we can do otherwise.

MR. DRAKE: The National Fire Protection Association and the Kentucky State Fire Prevention Association, with whose work I am most actively connected, are probably more interested in this Convention's work than any factor outside of the large cities. I shall take it upon myself to circularize all State fire prevention associations, asking them to order a copy of these proceedings for each member; and that should aggregate a large number.

MR. MASON: I think the Chair and every gentleman here will bear me out, as I appear on this floor as a delegate of Kentucky and not as a representative of my paper, that while I depend upon advertising for my living, I fully believe in getting this Record out without advertising, if possible. I will also write to the eleven or twelve State fire prevention associations and several fire protective associations and ask for whatever financial support they can give. Further, I shall use what influence I have with other associations in Kentucky, Ohio and other States I can reach. I will do everything in my power to forward the publicity about the results of this meeting.

MR. J. W. KELLY (Camden, N. J.): I shall see that every member of the International Association of Municipal Electricians is furnished with a copy.

MR. LINDBACK: In the Province of Manitoba the first thing I shall do will be to call a meeting of the Board of Trade and Underwriters' Association, and you will certainly hear from me or from these associations with a good order for these books. We need them more than anything else. We have been working here for a week and the results of our discussions are invaluable.

I wish to announce that the committee you appointed on the "Insurance" resolution *is now ready* and the secretary of the committee will read the report.

MR. EVANS: Thank you. Any other comments? (Pauses.) If not, we will have the report of the secretary of the committee appointed on the resolution under topic 14,—Mr. Goddard:

MR. GODDARD: The Committee presents the following unanimous report that the resolution under topic 14—"Insurance"—be amended in the following points:

Section A will remain as presented. Under section B, item 1, strike out the words "as to amount and conditions," items 2 and 3 under section B to remain as printed in the program. The last paragraph to be amended by inserting the word "contracts" after the word "insurance" in the first line, striking out in the same line the words "thus discouraging arson" and inserting in the last line, after the word "discouraging" the words "arson and." The resolution will then read: (Reads amended resolution.) And I take pleasure in seconding our chairman's motion that this resolution be adopted as revised.

MR. EVANS: It is moved by Mr. Lindback and seconded by Mr. Goddard that this resolution be adopted as amended. Motion unanimously carried.

Gentlemen, that concludes a big program most happily, and with the best purpose and intelligence of this country. I will tell you now frankly that I didn't expect to get through it myself!

Resolution Adopted on Topic 14

"It is the sense of this Convention that:

(a) The several States, territories and provinces should not only assure that permissible fire insurance is stable financially, but that the form of contract should be as clear, brief, explicit and sound as possible and, as nearly as may be, uniform in substance in all these jurisdictions, to the end that all such policies permitted to issue throughout the country may equally and adequately protect all citizens, including the ignorant and inexperienced; and

(b) Said jurisdictions should as nearly as possible adopt uniform regulations governing—

1. Issuance of fire policies on property,
2. Licensing of fire insurance agents and brokers, and
3. Licensing of fire insurance adjusters:—

To the end that only reasonable insurance contracts will be permitted on property, and that only men of sound character will be admitted to the business of writing fire insurance and adjusting fire losses, thus discouraging arson and complicity with fraudulent losses."

NOTE—See Appendix 2 (Report of Fire Waste Committee of the Chamber of Commerce of the U. S. of A.) concerning Standard Fire Insurance *Survey and Rating Schedules*—page 349-380.—ED.

SATURDAY MORNING SESSION, Final

Topic 15—"Organization"

NOTE.—The program of the Convention was concluded by discussion of future work.

MR. EVANS: The last topic, "Organization," is now before us and is of great importance because it is to provide the means whereby we shall proceed to accomplish the purposes discussed here. You have in the correspondence in the program the reasons clearly set forth why the purposes foreshadowed in the initial program last May with respect to forming a new "legislative and administrative" group in fire prevention work has been abandoned, so far as the speaker is concerned. I will now ask the National Fire Protection Association through its secretary to address you on this subject—"Organization."

MR. WENTWORTH: This seems almost like one of our own meetings. I don't believe there are many in the room who are not associate members of the National Fire Protection Association. But what we have to offer will be as much news to you, in one sense, as to the gentlemen not already in our membership. I assume you have read the letter written by Chairman Evans to the secretary of the National Fire Protection Association last July, in which he recommends the course we are now following. Something over a year ago, in our meeting in Chicago, as Mr. Goddard stated this morning, Mr. Evans presented a resolution that we have a publicity and legislation department, and that we extend our work of public education so as to be more effective in individual cities where we already have many members, but as yet locally unorganized. We worked well together on such matters as the Fourth of July program. Others of local interest continually arise which affect our cause but are yet neglected and not followed up, and cannot be except by coherent local organization. So with that idea in mind, following Mr. Evans's proposal, the association at the annual meeting held last May in New York authorized the appointment of a Committee on Public Information, and the executive committee, following the New York meeting, passed the resolution set forth in Mr. Evans's letter.

You see this is a radical departure for us, but how tremendously it will increase our forces and effectiveness! This committee has been organized as follows:

Franklin H. Wentworth, Secretary of the National Fire Protection Association, Chairman, Boston, Mass.
D. Knickerbacker Boyd, Chairman of Committee on Public Information of American Institute of Architects, Philadelphia, Pa.
Colonel Lewis T. Bryant, Commissioner of Department of Labor of New Jersey, Trenton, N. J.
Edwin Clark, Chief of Bureau of Building Inspection, Philadelphia.
J. S. Darst, Insurance Commissioner of West Virginia (representing National Convention of Insurance Commissioners), Charleston, W. Va.

C. A. Ellison, Fire Marshal of West Virginia (representing Fire Marshals' Association of North America), Charleston, W. Va.
Powell Evans, Chairman Philadelphia Fire Prevention Commission, Philadelphia, Pa.
C. M. Goddard, Secretary New England Insurance Exchange, Boston, Mass.
E. P. Heaton, Manager Insurance Department, Canadian Manufacturers' Association, Toronto, Canada.
Richard L. Humphrey, President American Concrete Institute, Philadelphia, Pa.
W. E. Mallalieu, General Manager National Board of Fire Underwriters, New York, N. Y.
Charles E. Meek, Vice-President National Association of Credit Men, New York, N. Y.
W. H. Merrill, Manager Underwriters' Laboratories, Inc., Chicago, Ill.
James McFall, Secretary International Association of Fire Engineers, Roanoke, Va.
Rudolph P. Miller, Superintendent of Buildings of Manhattan, New York, N. Y.
Oscar B. Ryon, General Counsel National Board of Fire Underwriters, Chicago, Ill.
Dr. S. W. Stratton, Director Bureau of Standards, Department of Commerce, Washington, D. C.
Thomas R. Weddell, Secretary Committee on Publicity and Education of The Union, Chicago, Ill.
H. M. Wilson, Engineer-in-Charge, Experiment State, Bureau of Mines, Department of the Interior, Pittsburgh, Pa.

That is a large committee of men who have demonstrated their interest in this work. We had our first meeting night before last. It was enthusiastic. I think we are at the beginning of a very large enterprise. We resolved to take up this work at once and organize local committees under this National Committee of Public Education, to be directed from the main committee representing these interests in the large aspects, but to have control over local matters, of which they must be the best judge. That practically is our program and the beginning of the organization has already been made. The members of the committees in the various cities represented the other night (Philadelphia, Boston, New York, Chicago and Pittsburgh) were made local chairmen, to go home to their cities and begin at once the organization of local committees. The work will be undertaken at once by the chairman of this committee in the association office in Boston, and the organization of these local committees will be accomplished as rapidly and forcefully as our means and office equipment will permit.

Mr. Evans: I venture to supplement Mr. Wentworth's remarks to bring out certain correspondence. This map (indicating) is only an effort to give you a brief visual view of the organizations in this country that can be brought into this fight. The number is surprising when listed.

American Association of Electrical Engineers (Commissioners and Inspectors).
American Conservation Congress.
American Federation of Labor.
American Humane Society.
American Institute of Architects.
American Warehousemen's Association.
Boards of Trade.
Bureaus of Municipal Research.
Chambers of Commerce.
Fire Marshals' Association of North America.

General Federation of Women's Clubs.
House of Governors.
International Association of Fire Engineers.
International Boilermakers & Iron Shipbuilders.
National Association of Credit Men.
National Association of Manufacturers.
National Association of Master Plumbers of the United States.
National Council for Industrial Safety.
National Hardware Association
National Lumbermen's Association.
National Municipal League.
Suburban Planning Association.
Water Works Association

That covers typical groups that can be brought into this fold. Mr. Dawson, assistant to Mr. Wentworth, has kindly put them in this form so you will see for yourselves how much material there is upon which to draw for our new organization.

With respect to Mr. Wentworth's proposition for organization, I judge what can be done by what has been done in almost every other instance. For the past six or seven years I have been active in the American Automobile Association, the Pennsylvania Federation of Motor Clubs, and the Automobile Club of Philadelphia, and I know what we motorists have done to create the good roads movement. It has been a constant uphill fight by a determined group of intelligent men who have let nothing discourage them. Our scheme was different from the plan in view here. We started with the *local* club and got the members full of enthusiasm and willing to spend some money. When we needed real political, legislative or engineering advice we got it through these men on the spot. That is what we must do here—establish an intelligent working scheme at home in each case. We must procure income locally through the local group, and must organize in each city and State some sort of office with a permanent executive—a man of some fire engineering experience—and a stenographer filing clerk, at least. If we can collect five dollars a year from all individual members in and around Philadelphia, for instance, two dollars can be set aside for the association journal. Of the three dollars remaining a dollar could be kept at home, another set aside for the State organization, and the remaining dollar used at National headquarters.

As to the present National Fire Protection Association *Quarterly,* its scope and future development has been the subject of much discussion of late in the Association management.

Its present style is *sui generis,* well developed and ably edited by Mr. Wentworth; but it is, nevertheless, highly special and technical, and cannot gain popular comprehension or use. It should be an entertaining yet effective and strictly up-to-date monthly, taking in first of all fire waste and its real significance, and joining in related social and sanitation work, so as to enlist the sympathy and coöperation of the women of the country and all civic workers. It might be as good a publication as the *National Geographic Magazine*. Geography is as dry as anything in life, but this magazine turns it into a charming story, and I send it to many of my friends at home and abroad yearly as a Christmas gift. The dry details could go in the National Fire Protection Association *Magazine* as an appendix for quarterly issues, while leaving the regular monthly issues free for clever and current information on fire hazards and related subjects in a popular strain.

We must have the local, State and National organization all properly organized and financed, with a binding medium in the form of a journal, to really accomplish achievable results. I don't believe any other scheme will succeed.

MR. RYON: There is one detail that was overlooked, but which may come up now. We have all expressed our anxiety to have the Record of this meeting prepared in good form under the direction of our Chairman. These proceedings need to be edited, as some of the thoughts have been confidential and also too voluminous; so I think they should be under the direction of the Chairman. I move that the editing of these proceedings be delegated to the Chairman, who can also select such assistance as needed.

Motion seconded by many, and carried unanimously.

MR. KOHN: I think the time has come when as representatives of the out-of-towners we who have come to Philadelphia and enjoyed this week should express our sense of obligation to the Philadelphia Fire Prevention Commission, and in the greatest measure to the Chairman of this congress, for the excellent work that has been done here. It takes a man of imagination to see a thing of this kind and carry it out. I have always contended that imagination is the most important thing in the world. Mr. Evans has it in such proportion that he looks forward to the National body, and I look forward to $2,000,000 coming into the treasury. But, to get serious, I will propose a motion—

MR. EVANS: Mr. Troth, will you, our host of yesterday, please take the chair?

MR. KOHN: I move that this Congress express by a rising vote to Director Porter of the Department of Public Safety, to the Fire Prevention Commission, and in a great measure to Mr. Powell Evans, our sense of appreciation of what has been done this week.

Motion seconded by many and carried, and the rising vote of thanks given. (Mr. Evans resumes chair.)

MR. EVANS: I will not take up much of your time in thanking you. I take it that I have made a great many friends here. I feel that way myself. None of us can work in any of these great problems without learning a great deal from each other and broadening our views tremendously, and unless we get together we cannot quite understand each other's point of view. I can only express my greatest thanks to the busy, important men who have come from a distance and remained here through this hard week. Any convention for a whole week is hard, where men work—and we have worked here well. If you will permit me, I will include in your thanks the management of the Bellevue-Stratford Hotel, who have extended us many courtesies for the week, and all others, especially our secretary and fire marshal, Mr. Mallory, who has long been busy in getting this Convention going; and, finally, to Mr. N. B. Kelly, secretary of the Philadelphia Chamber of Commerce, who wrote me that the Chamber of Commerce had no funds but inclosed his personal check for $100.

Is there now any motion with respect to our future organization? No formal resolution has been prepared.

MR. KOHN: I move that the sense of the Convention with regard to a general organization be as here expressed, and be referred to the Committee on Public Information for action.

Seconded by many, and carried unanimously.

MR. EVANS: There is only one final matter and that is whether you feel that we should express some opinion here now as to a future convention a couple of years hence in San Francisco.

I have received several communications from the director of the Panama-Pacific Exposition, who is planning a great insurance convention in San Francisco in 1915. This temporary Convention might with advantage adjourn to San Francisco in 1915, and show there what we have accomplished during the intervening two years.

MR. WENTWORTH: I, as secretary of the National Fire Protection Association, have received many communications from Mr. Hathaway, who is the principal insurance representative on the coast. I didn't respond to the first letter because I did not see why we should take part in a world's *insurance* congress; but I have since written that if he intended to present the problem of *fire prevention and protection* we would take an interest. He replied: "Yes," and stated they would have a fire prevention session. That may have meant a morning or perhaps a whole day, and I felt that very few of our members could go to San Francisco to attend a side-show to some insurance congress. We laid it on the table until we found out how much consideration we would get. If we get enough consideration a great many of our members would like to go out and help, but if it is simply a side-show as at the National Conservation Congress (to which we sent delegates who were hardly heard on the floor), we would not like to go.

Mr. Evans: I want to make Mr. Hathaway's invitation as clear as possible. (Reads letter from Mr. Hathaway.)

That certainly opens the way to coöperate with Mr. Hathaway as the commissioner to care for this whole phase at that Exposition, and to hold a second or third National Fire Prevention Convention there under the auspices of the Committee on Publicity of the National Fire Protection Association.

On motion the thanks of the Convention were voted Mr. Hathaway for his invitation.

Mr. George M. Robertson (San Francisco): I feel that I should say something very important, but don't exactly know how. I am somewhat overcome by the magnitude and extent of the work this Convention set out to do and has accomplished. I feel sure it will accomplish a great deal more in results finally. I am not authorized by any public body in San Francisco, or anybody else there, to invite you to come to San Francisco; but I know perfectly well that if this had been foreseen I should have been clothed with some such power. I should like, therefore, to carry out the ideas of this Convention, both as to its work and its coming to San Francisco. I am a member of some kind of committee (I don't yet know just what) appointed by Mr. Hathaway with regard to the Convention. However, I can say and do say that you will meet with the warmest kind of welcome if you can manage, either as the National Fire Protection Association or this Convention, to come to San Francisco in 1915. So I think it well to consider the propriety and practicability of coming there. To repeat, Mr. Chairman, I not only promise you a very warm and decided welcome there, but I personally thank you for the very warm welcome we have had here and the immense amount of information I have absorbed.

Mr. Goddard: In order to have some definite proposition before the Convention for discussion, and in order that we may not lose the opportunity of availing ourselves of any means of advancing the cause of fire prevention, I move it be referred to the Chairman of this Convention and the Chairman of the Committee on Publicity of the National Fire Protection Association, to take such action as they may find in their opinion wise in regard to calling a convention similar to this at some future date, either in San Francisco in 1915, or sooner or later; but leave it to the Chairman of this Convention, Mr. Evans, and the Chairman of our Publicity Committee, Mr. Wentworth. I think the gentlemen here can rest assured that any decision which they may reach on the subject will meet with their approval, as has every other proposition brought before us.

Mr. Mason: In seconding that motion I would like to say a word. When I left Cincinnati it was with a clear understanding that there was to be no permanent organization here; but, understanding the possibilities that one might be formed and with the understanding that steps might be taken for the holding of another meeting in the near future, I laid the matter before our Chamber of Commerce and other organizations. It seems to me more than ever that provision should now be made for calling another convention next year. I think once a year not too often. With all these things in mind I wish to lay before the committee having that matter in charge an invitation from the city of Cincinnati, supplemented by one from the Chamber of Commerce of that city, that if a convention is held next year consideration be given to the central location and other advantages which make Cincinnati advisable for a meeting place. (Presents invitations.)

On motion the thanks of the Convention were voted to the Government of the city of Cincinnati and the Chamber of Commerce and Hotel Association of that city for their invitations.

Mr. Heaton: I can say for Mr. Lindback, and one or two other members from Canada taking part in this Congress, that we appreciate the opportunity of coming here. We recognize, in the northern part of the country, that we are a relatively small population, and must be detached from you in the great work you have undertaken. Yet we are a part of the broader National fire protection movement, and I want to express our thanks for the opportunity offered; and I wish to be placed on record as a representative of the Canadian people in trying to form an important part of any subsequent congress that may be held. You understand why we cannot have a large representation, yet our object and method of procedure is the same as yours, and we should take every opportunity to help you, especially in the earnest, sincere and enlightened conduct of meetings embracing such a large convention as this. We have lots of conventions, as you have, yet I am free to say that in the whole course of my experience, extending somewhat over forty years, I have never sat in a prolonged convention where a skillful guiding hand was necessary and yet so admirably exercised as we have had in this Convention. I believe it only right, before the meeting closes, that we from Canada should place in the Record of this Convention our thoughts and sentiments.

Mr. Evans: I can only thank you again. Praise from such a source is praise indeed. Please remember you are the guests of Director Porter again this afternoon to see the police parade. The secretary will provide you with tickets and police escort through the lines to your seats.

Mr. Goddard's motion, seconded by Mr. Mason, was put to vote and unanimously carried.

MR. EVANS: In view of the proposal that has been voted to the effect that I should confer with Mr. Wentworth about a continuation or repetition of this Convention, our adjournment should be ***sine die***.

It was moved and seconded that the Convention should adjourn ***sine die***.

Motion carried unanimously, and meeting adjourned, without date.

POWELL EVANS
Chairman

FINIS

APPENDICES

APPENDIX 1

DEPARTMENT OF PUBLIC SAFETY
OFFICE OF THE DIRECTOR
CITY HALL, PHILADELPHIA

FIRE PREVENTION COMMISSION
Powell Evans, *Chairman*

Walter F. Ballinger	Charles A. Hexamer
D. Knickerbacker Boyd	H. W. Forster
William C. Haddock	R. H. Newbern
Robert S. Perry	Jesse D. Burks

RE NATIONAL FIRE PREVENTION CONVENTION
PHILADELPHIA, PA., OCTOBER 13th to 18th, INCLUSIVE; 1913

Room 420, City Hall
July 3, 1913

NATIONAL FIRE PROTECTION ASSOCIATION
MR. FRANKLIN H. WENTWORTH, *Secretary*
87 Milk St., Boston, Massachusetts

MY DEAR MR. WENTWORTH:

I beg to acknowledge receipt of your several recent letters, including your valued acceptance, dated July 1st, of the invitation to attend the National Fire Prevention Convention here next Fall, naming your entire executive committee to represent you; also your letter, July 1st, notifying me of election to your Committee on Public Information as representing your active membership of the National Hardware Association; also your further letter of July 1st, enclosing copy of recommendation to your executive committee for the appointment of the new Committee on Public Information, with tentative draft of the personnel of said committee.

With respect to my appointment on this committee I accept with pleasure.

I this day communicated with Mr. H. A. Wheeler, president of the Chamber of Commerce of the United States of America, 10 South La Salle street, Chicago, informing him of the suggestion of his name on this committee, and requesting that he take adequate membership in the N. F. P. A. for this purpose, and act on the committee as a business representative of same. * * *

Now, with reference to the impression that you still hold of an "intention on my part to form an additional national (fire prevention) organization at Philadelphia," it is necessary for me to go somewhat at length into an answer to make it reasonably clear.

May 3, 1912, I wrote vou the following suggestions:

1. The establishment of a Legislation and Publicity Division of the N. F. P. A. (national in scope) with State branches and municipal sub-branches (composed more than one-half of your trade association active members) to study and prepare legally and physically, and get enacted and enforced, substantially uniform State

and city legislation throughout the country to control fire waste of life and property.

2. The preparation and adoption of "compulsory" standard of fire prevention and protection apparatus, based on the lowest reasonable requirements as measured by field and laboratory experience of the last ten years, for incorporation into State laws and municipal ordinances—to bear as lightly as possible on the public—forced in numbers by such legislation to such expense for the common welfare.
3. The advocacy of a legally enforced universal and periodic (annual) *occupancy* and *housekeeping* license in at least all congested areas of cities, as to persons, pursuits and property housed in all buildings within defined geographical lines.

These three propositions came on the floor of the N. F. P. A. annual meeting in Chicago soon after and were referred to the executive committee, without any conclusion, as I recall.

The enclosed clipping from the Philadelphia *Record*, March 8, 1913, describes an associated fire prevention meeting in Mayor Blankenburg's office here this Spring, which you attended on your speechmaking tour under the auspices of the American Institute of Architects. At that time I alluded to a proposal to organize a fire prevention convention in this city the coming Fall and outlined the proposition of an American fire prevention league to carry out a legislative and administrative program all over the country—a national organization with city branches and municipal sub-branches—and up to that time you had not intimated to me that the N. F. P. A. had any intention of acting favorably on enlarging their scope of work to embrace this wider field of action.

In due course this Commission, with the assent of this city administration, adopted the plan for holding a fire waste convention here this Fall and sent out their invitations about May 1st. At the N. F. P. A. annual meeting in New York, about the middle of May, the Association adopted, *inter alia*, the suggestion in the report of the executive committee, viz:

> Regarding the suggestion bearing on the subject of legislation and publicity, we recommend the appointment of a general committee on this subject, to be known as the Committee on Public Information with sub-committees in the various States and provinces to work under the direction of the general committee of which the secretary of the association shall be chairman.

I first heard of this action when I reached the Association meeting on the second day's session, and I then expressed to all the membership of the Association I could reach my deep interest and gratification. Later the question arose as to the scope of the proposal which the executive committee acting under the above-defined general power would take to carry out this wider activity—hence my letter to you dated June 5th, written during our talk here on the subject, and the action of the executive committee of the N. F. P. A. at their annual meeting, June 23d last, as follows:

> In accordance with authority given by the last annual meeting, it was voted to appoint a committee on public information, to be empowered:

1. To organize State, provincial and municipal sub-committees, and provide for the support thereof.
2. To encourage legislation for the enforcement of fire prevention standards and inspection and good housekeeping conditions.
3. To agitate for the continuous and regular enforcement of such legislation when passed.
4. To take such other steps to further the ends of education, legislation and its enforcement for the protection of life and property against loss by fire as the committee may deem wise.

At this meeting I again expressed my entire sympathy and satisfaction with the course being followed.

Following this movement of the executive committee comes your letter of July 1st with tentative draft of committee on public information, in which you have dealt so fairly with all interests in the country committed to an abatement and control of fire waste. No fair and reasonable mind could fail to realize that if this new committee on public information of the N. F. P. A., of which you have been made the permanent chairman, carries out the authority and purpose expressed in the resolutions above cited, then the strongest and widest and most powerful force in any permanently organized form that the country can produce has taken progressive charge of this national problem. It means that this force has divorced itself from any purely insurance underwriting views of the matter, because this plan of action has as its principal purpose the reduction of the fire waste of the country—which must inevitably be followed by a largely proportionate reduction of the insurance premiums of the country; and this can only mean some readjustment of methods of underwriting to bring the practice in this country closer to what it has been in Europe for years.

This course of action further has in view the imposition of minimum standards of construction, protection, equipment, occupancy and management of buildings through the police power all over the country—thus making the reduction of the fire danger and of the present fire waste largely compulsory instead of voluntary. The objection to the insurance underwriting activity that has hitherto been urged against it by the critics of insurance has been that underwriters on the average have inspected property, not to better property so much as to inform themselves of the condition of properties, so that they would know what rate to charge on the one hand and how little of the risk to take on the other.

Your present action involves a proposition of police inspection of property continuously to force the compulsory minimum standard in the construction, protection, equipment, occupancy and management of property, not only to abate fire risk to the property itself and contents, but to care for the life hazard with which the underwriting inspection hitherto has not specially concerned itself.

So far as my own interest and activity are concerned your action has fully covered the field of my own aspirations, and I desire to go on record as being in entire sympathy and accord with your program, with the wish only to advance it as speedily and effectively as possible and to rely on it as the sole agency to this end. * * * Your recent Association action in forming a committee on safety brings you into a much wider field of activity and will tremendously strengthen you before the public.

Please pardon the length to which this letter has run, and permit me to say in conclusion that your most important work to my mind in this new committee is that of *organization.* I am satisfied that this new committee will have to divide its work into sub-committees—say one on Organization, another on Administration and Legislation, another on Education and Publicity, another on Compulsory Physical Standards, and so forth. I have thought a great deal about this problem of organization in recent years, and if you care to have me undertake this phase of this work I would be happy to do so.

Very truly yours,

POWELL EVANS, *Chairman*
Philadelphia Fire Prevention Commission

ROBERT D. KOHN, *President* FRANK M. DRAKE, *Vice-President*
FRANKLIN H. WENTWORTH, *Secy. and Treas.*
87 Milk Street, Boston

NATIONAL FIRE PROTECTION ASSOCIATION

ACTIVE MEMBERS

ROBERT D. KOHN, *President*
FRANKLIN H. WENTWORTH, *Secy. and Treas.*
FRANK M. DRAKE, *Vice-President*
American Institute of Architects
American Institute of Consulting Engineers
American Institute of Electrical Engineers
American Electric Railway Association
American Warehousemen's Association
Alabama Fire Prevention Society
Arkansas Actuarial Bureau
Arkansas Fire Prevention Association
Associated Factory Mutual Fire Ins. Co.'s Inspection Bureau
Association of Fire Underwriters of Baltimore City
Board of Fire Underwriters of Allegheny County
Board of Fire Underwriters of the Pacific
Board of Fire Underwriters of Territory of Hawaii
Boston Board of Fire Underwriters
Buffalo Association of Fire Underwriters
Bureau for Safe Transportation of Explosives
Canadian Fire Underwriters' Association
Canadian Manufacturers' Association
Chicago Board of Underwriters of Chicago
Cincinnati Fire Prevention Bureau
Cleveland Inspection Bureau
Cotton Insurance Association
Electrical Supply Jobbers' Association
Factory Insurance Association
Factory Mutual Laboratories
Fire Underwriters' Electrical Bureau
Fire Underwriters' Inspection Bureau
Florida Fire Prevention Society
Illinois Inspection Bureau
Illinois State Fire Prevention Association
Independent Petroleum Marketers' Association of U. S., The
Indiana Inspection Bureau
Insurance Association of Providence
International Acetylene Association
Inter-Mountain Fire Prevention Association
International Association of Fire Engineers
International Association of Municipal Electricians
Iowa State Fire Prevention Association
Kansas Inspection and Fire Prevention Office
Kentucky Actuarial Bureau
Kentucky State Fire Prevention Association
Louisiana Fire Prevention Bureau
Louisiana State Society for the Reduction of Fire Waste
Mainland Fire Underwriters' Association of B. C.
Massachusetts Association of Municipal Electrical Inspectors
Massachusetts Mutual Fire Insurance Union
Massachusetts State Fire Prevention Association
Michigan Inspection Bureau
Michigan State Fire Prevention Association
Milwaukee Board of Fire Underwriters
Minnesota State Fire Prevention Association
Mississippi Inspection and Advisory Rating Company
Mississippi Society for the Prevention of Fires
Missouri Actuarial Bureau
Missouri Fire Prevention Association
Mutual Fire Prevention Bureau
National Association of Cement Users
National Association of Credit Men
National Association of Electrical Inspectors
National Association of Local Fire Insurance Agents, The
National Association of Manufacturers of U. S.
National Association Master Gravel and Slag Roofers of America
National Association of Sheet Metal Contractors of U. S.
National Board of Fire Underwriters
National Convention of Insurance Commissioners
National Electrical Contractors' Association
National Electric Light Association
National Hardware Association of U. S., The
National Implement and Vehicle Association
National Paint, Oil and Varnish Association
Nebraska Inspection Bureau
Nebraska State Fire Prevention Association
New Brunswick Board of Fire Underwriters
New England Bureau of United Inspection
New England Insurance Exchange
New Hampshire Board of Fire Underwriters
New York Board of Fire Underwriters
New York Fire Insurance Exchange
North Carolina Fire Prevention Association
North Dakota State Fire Prevention Association
Nova Scotia Board of Fire Underwriters

Ohio Inspection Bureau
Ohio State Fire Prevention Association
Oklahoma Inspection Bureau
Oklahoma State Fire Prevention Association
Ontario Fire Prevention Association
Philadelphia Fire Underwriters' Association
Philadelphia Suburban Underwriters' Association
Rocky Mountain Fire Underwriters' Association
South Carolina State Fire Prevention Association
South Dakota State Fire Prevention Association
South Eastern Underwriters' Association
St. Louis Fire Prevention Bureau
Suburban Fire Insurance Exchange
Tennessee Fire Prevention Association
Tennessee Inspection Bureau
Texas Fire Prevention Association
The Union
Underwriters' Association of the Middle Department
Underwriters' Association of New York State
Underwriters' Bureau Middle and Southern States
Underwriters' Bureau of New England
Underwriters' Laboratories, Inc.
Virginia Fire Prevention Association
Western Actuarial Bureau (Fire)
Western Canada Fire Underwriters' Association
Western Factory Insurance Association
Western Sprinklered Risk Association
West Virginia Inspection Bureau
West Virginia State Fire Prevention Association
Wisconsin Inspection Bureau
Wisconsin State Fire Prevention Association

MR. POWELL EVANS New York, July 14, 1913
Chairman Fire Prevention Commission
City Hall, Philadelphia

MY DEAR MR. EVANS:

Thank you very much for your letter of the 9th inst. with enclosure of letter addressed on the 3d inst. to the Secretary of the N. F. P. A. Your organization was initiated at a time when you assumed that the N. F. P. A. was not going to act on the suggestion you made to the Convention of 1912. I am pleased at your statement that the scope of the work of the new Committee on Public Information of the N. F. P. A. covers the field of work you propose should be done. I hope that the new committee will be in shape to take full advantage of your October Convention, and organize the forces there developed into active coöperation with and in the National Fire Protection Association, as you have suggested.

Very truly yours,
ROBERT D. KOHN, *President*
Per M. M. A.

SPECIAL BULLETIN

87 Milk Street, Boston, August 20, 1913

Conference on FIRE PREVENTION, Philadelphia, October 13-18

TO ACTIVE MEMBERS:

The executives having by unanimous vote resolved to coöperate with the Philadelphia Fire Prevention Commission in its endeavor to bring the subject of fire waste and fire prevention forcibly before the country at a national conference in Philadelphia the week of October 13th next (invitation to which has already been sent you by the Commission) it is earnestly requested that your organization be ably represented at this conference and that your representatives, in the discussions of the important subjects to be considered, and in all other business of the conference, take an active and interested part, that the National Fire Protection Association may not fail to aid in every way consistent with its organization this worthy and arduous undertaking. By unanimous resolution our entire executive committee, including the officers, voted to attend the Conference as delegates.

Very truly yours,
FRANKLIN H. WENTWORTH
Secretary

APPENDIX 2

1914 Report of the Fire Waste Committee
OF THE
CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA

PHILADELPHIA, PA., U. S. A., March 19, 1914

To Members and Councillors, Chamber of Commerce of U. S. of A.

GENTLEMEN: The attached Annual Report of the Fire Waste Committee of the National Chamber with its addenda speaks for itself.

We invite your particular attention to the facts about the new publicity given at this time on the insurance schedule rating of property in Pittsburgh and this City under order of Court, and the annexed reproductions of the Pittsburgh schedule and survey blanks.

The Philadelphia Fire Underwriters' Association, having jurisdiction in Philadelphia, in addition to their general blanks (of the same general tenor, form and substance as those used in Pittsburgh) have also a "sprinklered risk" schedule blank and associated blank for grading automatic sprinkler protection; also the following schedule and rating blanks:

A

1 Lumber yards
2 Smokehouses
3 Brick works
4 Piers and wharves
5 Theaters and similar places of amusement
6 Electric carbarns and carsheds
7 Coal in yards, pockets or under sheds
8 Stables
9 Breweries and malthouses
10 Electric light, power, transformer and all storage battery stations

Also the following coupon blanks to be used in connection with the general schedule in rating—

B

1 Lumber drykilns
2 Glassworks
3 Pickerhouses
4 Carding and/or spinning mills
5 Slaughter houses, packing houses, sausage-making and lard-rendering establishments
6 Shoe factories
7 Dryhouses (textile)
8 Wallpaper factories
9 Dyehouses, print and color works, bleacheries (chemical), finishing establishments and rag extracting works
10 Weaving and/or knitting mills
11 Metalworking establishments
12 Woodworking establishments
13 Public warehouses
14 Printing offices, book binderies and lithographic establishments

The subject of fire insurance is one which receives very little attention in most business offices until a fire occurs. Very often the discovery is made that, through oversight or lack of experience, insurance is improperly written or property improperly covered. This of course leads to misunderstandings and frequently to heavy losses, as errors cannot be adjusted after a fire.

Further, the ordinary business man owning and occupying property finds difficulty in making out just what these schedules mean, while the insurance companies consider that they pay brokers to understand them and write up policy contracts thereon.

An impartial investigation of the whole subject might result in the conclusion that the complexity of property itself for the range of the country and the insurance contract thereon warrants these complex and varying schedules. Would it not be reasonable, however, to ask that every stock fire insurance underwriting board in the country should at least adopt a uniform type of survey and schedule blanks (as is the practice of the mutual companies for their inspections now, per attached blank), so that if a property owner once learned to understand one set he would know them all? It will never be possible to make any real progress to inform business men throughout the country about the basic facts of fire prevention and protection and insurance until they can understand *what the contract itself means;* and they can never understand that until they understand the *basic scheme of survey and schedule rating underlying the contract;* and they can never understand that in turn unless this *survey and schedule scheme be simplified and made uniform.*

For like reasons there is an insistent and growing demand that the insurance contract or form of policy should be made standard and uniform throughout the country. There is no thought or purpose here of suggesting that insurance rates themselves be regulated—although there are advocates of the State undertaking this function. The sole idea advanced here is that the highly technical and involved survey and schedule on which the detail of the final rate is built should be made simple, uniform and intelligible all over the land.

The Interstate Commerce Commission on sound grounds finally required the form of railroad book accounting to be made uniform and as simple as the problem permitted all over the country; and this procedure clarified the problem very much and made it possible for investors to understand the real facts concerned. The railroads objected to this course at first, although they now see that it was a wise and proper requirement.

Should not the insurance interests at this time recognize the wisdom of studying and advocating the simplest uniform blanks for the fire insurance policy, and survey and rating schedules, for universal application?

I invite your particular attention to this situation; and again ask you to carefully review this entire report; and to procure complete sets of fire insurance policy and survey and schedule forms from the insurance board having jurisdiction over your property and forward them to this committee at this address at your early convenience, for comparison and further recommendation.

Very truly yours,
FIRE WASTE COMMITTEE
CHAMBER OF COMMERCE OF U. S. OF A.
By POWELL EVANS, *Chairman*

National Fire Protection Association, March 19, 1914
Mr. Robert D. Kohn, Pres.,
56 West 45th St., New York City.
(Copy to Mr. Wentworth, Sec.)

MY DEAR MR. KOHN: Enclosed please find copies of letters this day written to members and councillors of the Chamber of Commerce of the U. S. of A. and the National Association of Credit Men with regard to the desirability of standard and uniform fire insurance rating schedule, survey and policy blanks.

It has been a tradition and convention in the National Fire Protection Association heretofore that the whole subject of rates should not be debated in what was held to be a technical body. The world is moving, however, and we all must move with it. Is it not now distinctly within the province, and really the duty, of this national organization devoted to abating fire waste to take it upon themselves to clarify every phase of the situation which influences the fire prevention and protection movement?

The business men of the country today have not, and should have, an intelligent understanding of their insurance problems. Simplicity and uniformity in all details on the subject would certainly aid in enabling them to acquire accurate knowledge and understanding of this intricate subject, and put them in a position to use their own judgment and interest in the matter, instead of relying solely on the possibly self-interested opinion of an insurance broker exclusively.

There seems to be nothing in the articles of association of the N. F. P. A. which would interefere with their taking up the study and formulation of standard and uniform rating schedule and insurance blanks; and Article 2 would seem clearly to cover this activity. As an advocate of the commercial bodies throughout the country operating with your new municipal chapters to study, control and abate fire waste, I would suggest that the N. F. P. A. form a committee to the above end. The association has in its membership the very men who are best informed and equipped to accomplish this reasonable purpose with the least amount of effort and error for the general good—whether they have taken such action in the past or not.

May I ask that this suggestion be placed in a proper manner before the Association for consideration at its coming annual Spring meeting?

Very truly yours,
POWELL EVANS, *Chairman*
Fire Waste Committee, Chamber of Commerce
of the U. S. of A.

PHILADELPHIA, MARCH 23, 1914

National Association of Credit Men,
Mr. J. H. Trego, Sec.-Treas.,
41 Park Row, New York City.

DEAR MR. TREGO: Enclosed please find copies of letters this day addressed to members and councillors of the Chamber of Commerce of the U. S. of A. and the National Fire Protection Association with respect to a movement to bring about simplified uniform blanks for fire insurance rating schedules, and policy, for adoption throughout the country.

I call this to your attention as a member of your organization, believing that the purpose is practical, important and urgent; and that the credit men are peculiarly charged with the duty of clarifying just such commercial situations as this for the benefit of the business men of the nation.

Very truly yours,

POWELL EVANS

REPORT OF FIRE WASTE COMMITTEE

Although fire is always a strictly local occurrence, the aggregate of all fires (in waste of life and property) and the indemnity for all fires (fire insurance *in toto*) is a truly national humanitarian and economic problem of great importance; and hence the inclusion of this subject among the activities of the Chamber of Commerce of the United States of America and the creation of this Fire Wase Committee. The Committee is concerning itself more with the prevention and abatement of the destruction from fire than with the purely insurance phase of the subject. Western Europe's fire waste and cost of insurance are only *one-tenth* of that in the United States and Canada. Let us first reduce this waste, and then see that the cost of insurance protection against this is made reasonable.

The fire waste record, compiled from the *Journal of Commerce and Commercial Bulletin,* for 1913 for the United States and Canada totalled in round numbers 225 millions of dollars—a fair reduction from the average of 246 millions for the past ten years—showing some control of this waste because we have at least kept it measurably stationary during the same period that the increase of created property and insurable value has been notable. The only total figures we have on the subject come from the above source and are currently quoted in the *National Fire Protection Quarterly.*

Our State and municipal fire marshals and officers should cover the country and be authorized and required by law to investigate, tabulate and report the actual figures of this waste; while our fire insurance underwriters should likewise be required by law to report the aggregate of fire insurance figures for the correct summary of the indemnity loss. We will never discover the correct policy for dealing with this enormous and largely useless waste in life and property from fire until we establish the basic and authoritative figures upon which we can safely move in the matter. The nation must adopt a *preventive* policy to stop both the number and extent of fires if it purposes to control and reduce this waste. The preventive policy has certainly yielded positive and satisfactory results in sanitation and in controlling accidents and fire waste. The evidence leading to this conclusion extends over a sufficiently long time and a sufficiently wide range to be conclusive and unanswerable. It is not yet sufficiently widely recognized and applied to fire-waste reduction.

In the States of Ohio and Wisconsin and in the cities of New York, Philadelphia, Cincinnati, Cleveland, New Orleans, Rochester, Youngstown, and many others, this preventive policy has yielded admirable results in practice. Friends of the movement should now bend their energies toward the *application of this practice* in all States and municipalities throughout the nation.

During the past eleven months to February 1, 1914, the city of Philadelphia inspected over 50,000 buildings other than residences, and reinspected 34,000 of these, principally in the congested areas of the city—the most dangerous sections—using the surplus time and energy of the active fire-fighting force without added expense for this work; and effected more than 120,000 detailed improvements in property and living conditions therein to prevent fire hazard.

The fire loss of Philadelphia during 1913 was nearly one million dollars (nearly one-third) less than during 1912, and the lowest with one exception of any year for a decade. During January, 1914, 408 fires occurred, and only 56 of these took place in buildings which had been so inspected—this incident affording an indication of the efficacy of the preventive treatment of fire waste. If the third largest city in America can without added expense to the community and with the existing personnel employed by the community accomplish these beneficial results, through the leadership and inspiration of citizen effort, why cannot every other like community in the country do likewise, and as well or better?

Circular No. 1 from this Committee, dated January 23, 1914 (addendum No. 1 hereto), embodies a brief statement on this whole subject, and three concrete suggestions as to a practical course of procedure locally everywhere which would lead to speedy and actual reduction of fire waste.

Many of our members are already at work on this problem locally, but are not following any uniform or concerted activity in the matter. Many others are interested in learning how to work efficiently and are willing to proceed actively with it. Others are already affiliated with the central activity in the country, viz: The National Fire Protection Association—and prefer to continue their efforts through this organization. Two only of the 1000 members and councillors addressed have expressed indifference to the propaganda.

It will be difficult to remedy national carelessness, indifference and ignorance on fire waste, even with all agencies working to this end throughout the country in unified, concerted action; but, if divided, progress will be still slower. The business men of every community, together with the local government officials concerned and the insurance interests concerned, should be in tripartite organization in this work. There is no need nor room for a new agency in the matter if the above controlling factors come earnestly together, particularly in view of the fact that the National Fire Protection Association (headquarters 31 Milk street, Boston) is now organizing municipal chapters throughout the country and inviting into them just such affiliations as our local members.

In round numbers $35,000,000,000 are insured in this country and 80 per cent. of this by stock insurance. In some respects the bulk of the insurance interest has not heretofore been as efficient or helpful as it could have been in opposing the basic fire waste.

In order to ventilate this subject thoroughly the Philadelphia Fire Prevention Commission held in Philadelphia last October the first national fire prevention convention ever organized in this country. The Record of this Convention, in its papers and discussions, presents the most complete authoritative and rounded-out knowledge and experience on our national fire waste problem that has been collected anywhere up to this time, embodying the work of approximately 300 of our most representative men qualified to speak on the subject from every angle of knowledge, experience, and location. It will incorporate further the detail work of fire-waste control in the city of Philadelphia during the past two years, and with the permission of this Chamber this first report of its fire waste committee. This Record is now ready for the press and will be obtainable within 60 days. It contains a frank and full analysis of the insurance attitude throughout the country with respect to fire waste, and constitutes the best available all-round textbook for both officials and commercial organizations to study and follow in organizing their future work on this subject. If ordered in quantities by Chamber members it is now procurable at 35 cents a copy, and its wide circulation is urgently advised. It is impossible to lay before you here in detail the replies of Chamber members to this committee's recent circular No. 1, but it is evident that further organization of our members in fire-waste control work will require a continuation of extensive correspondence and a continued circulation of advice in detail as to how to organize and work efficiently. This means time and money for the committee's use. Effective work can hardly be done from the chairman's office for less than $150 a month.

Suggestion C of the committee's circular No. 1, inviting Chamber members to get their constituent membership to improve their property physically to control the fire hazard, will receive great impetus from the following recent circumstance: During 1913, in the case of Commonwealth of Pennsylvania vs. The Allegheny County Board of Fire Underwriters, the Court handed down a decree requiring the local insurance rating boards to make public to property owners the detail schedule basis of their respective rates, and the items of improvement possible, and allowances in the rate for same. If this policy becomes national in scope through either the force of statute law or court decisions it will provide the best existing actual knowledge all over the country for physically improving old properties and constructing new ones (Addendum No. 2 hereto gives the facts in detail). If trade organizations at the same time throughout the country inspire their individual membership to take advantage of this knowledge, a long step will have been made toward basically stopping fire waste conditions, and inevitably a marked reduction of the fire hazard to life and property; and, in time, the cost of insurance will ensue.

The nation has been living too extravagantly and has now reached a condition where economies, particularly those that abate *useless* waste, must become a controlling policy in our national life. About half of all fire waste arises from dirty, careless and ignorant living in buildings; and this situation accounts for virtually half of all bad health and bad morals. This National Chamber, with its widespread and growing organization of business men, should become a leader in this movement, and draw into concert with its efforts the advocates of sanitation and moral living who must travel the same road in actual practice to accomplish their various ends.

The chairman of this committee was in Washington twice during 1908 to attend the first two National Conservation Congresses to urge the same course of action that he continues to urge here now. Extended study and experience during the intervening period has confirmed his belief as to the soundness of the policy and practice advocated in this report.

In conclusion the following Resolution is suggested:

> *Resolved,* That the Executive Committee of the Chamber of Commerce of the United States of America be and is hereby empowered—
>
> (a) To request and authorize the Fire Waste Committee to investigate the advisability of suggesting to constituent local members the basis on which they may become affiliated locally all over the country with the new Municipal Chapters of the National Fire Protection Association, and combine with them in organizing local work to investigate and control fire waste of life and property in their respective communities; and,
>
> (b) To clothe said Fire Waste Committee with power to take such action if upon investigation it deems this course wise.

POWELL EVANS, *Chairman*
Fire Waste Committee, Chamber of Commerce
of the U. S. of A.

(Unanimously adopted.)

ADDENDUM 1

Circular No. 1

Philadelphia, January 23, 1914.

The purpose of this committee is to inform and inspire the members of the National Chamber to engage in a policy of fire prevention and protection which will physically and morally assist in reducing fire waste. Purely insurance considerations cannot be followed further in this effort than their legitimate interrelationship warrants.

Such semi-public bodies as chambers of commerce, boards of trade, etc., which speak for the business world in their respective communities, should thoroughly understand two main propositions covering fire waste:

1. The fundamental nature of fire waste, its distribution through insurance, and the resultant cost of insurance; and,

2. The known means whereby this waste may be decreased in practice, with a resultant decrease of insurance cost in time.

There is no question but that half of all fire waste arises from bad occupancy (which means the improper conduct of a given business in a given structure), and from bad management (which means careless and improvident daily life). Bad construction, bad protection and bad equipment of buildings are responsible for another very large proportion of the total waste.

In western Europe both fire waste and the cost of insurance are about one-tenth of these costs here. Their ratio is the same, but the absolute amount is only 10 per cent. of what we pay at either end.

We now make the following concrete suggestions:

1. That the constituent members of the National Chamber should each form a committee on fire waste, or the equivalent. These local committees should each study and formulate a plan for coöperation in its own locality with all similar agencies now organized, or that might be created and energized, to work to this same end.

The main purpose of such committees should be to spread the policy and practice of fire prevention and protection to stop fire waste of life and property, instead of confining their interest to considerations of the distribution of this loss through the medium of insurance. The work will be found upon experience to divide naturally into three main courses of action, as follows:

(a) The local chamber committee should undertake to create, or combine with other existing agencies at work to create, a local central fire waste committee in each community, to unify all obtainable information and influence to control the fire hazard in and about each community—such effort usually being municipal in scope, with the possibility that all municipalities so organized in any State could combine into a State organization for a State policy in this connection. The National Fire Protection Association is now definitely embarked on a National policy in this direction, in close coöperation with two of its active members, the National Association of Credit Men and the American Institute of Architects, working in detail through their various chapters throughout the country. Coöperation with these agencies in every center is advisable.

The chamber committee should be headed by a forceful and experienced business man without direct or indirect insurance affiliations, and should include, further, an experienced fire insurance underwriter, an architect and/or engineer, a contractor and/or builder, a lawyer, and the heads of city departments concerned in this matter, such as the city fire marshal, chief of bureau of building inspection, chief of the water bureau, chief of the bureau of fire, or their equivalents.

(b) This chamber committee should first study and formulate a community policy with respect to fire control (illustrated by the work of the Philadelphia Fire Prevention Commission, detailed in my book, "Fire Waste," procurable from me on request), and effort should be directed toward a policy of continuous clean-up and betterment of property in every community through the use of active firemen, in reasonably limited numbers, for inspections, as is now done in Philadelphia, Cleveland, Cincinnati and a number of other American cities. An average of 40 firemen assigned to this duty in Philadelphia, during the last ten months of 1913, inspected and reinspected 77,000 properties and accomplished over 108,000 corrections of fire hazard conditions. The fire loss in Philadelphia during 1913 was less than two millions of dollars, against over three millions during 1912. Certainly a large part of this reduction in fire waste here was the result of the above work, not only from the improved conditions of properties, but their general and continued clean-up.

The city of New York within the past two years has been able to reduce the actual number of fires approximately 20 per cent. and to shrink its annual fire waste from approximately twelve millions to below eight millions of dollars per annum by a similar policy.

Cleveland, Cincinnati, Rochester and numerous other cities, particularly in Ohio, show equally favorable results from this course. It should become a definite National municipal policy on the subject. (Enclosed is copy of the active firemen's inspection report used in Philadelphia.)

(c) The local chamber committees will find another important field for work in teaching their individual members how to reasonably improve and live in their properties so as to abate the fire danger and at the same time get lower insurance rates.

The Associated Factory (Mill) Mutual Fire Insurance Companies show the following remarkably low cost for their insurance as follows:

They totally insure in this country, in round figures, two billions seven hundred millions of dollars. Based on averages of the past five years their fire losses have been only 2.6 cents per hundred dollars—made up of .4 cents from water damage (including sprinkler leakage) and 2.2 cents from fire loss. Their expenses have been—general expenses, 1.8 cents; inspection, 1.5 cents—aggregating 3.3 cents per hundred dollars. Their taxes have been 1.5 cents per hundred dollars. Their total of all losses and expenses of underwriting has been 7.4 cents per hundred dollars. Deducting income from premium deposits, 1.75 cents per hundred dollars, leaves a net cost for insurance, scattered all over the United States, of 5.65 cents per hundred dollars.

Enclosed is the standard mutual insurance inspection blank. Virtually all of their inspection is done by 26 expert inspectors, directed from a central office in Boston, who visit practically all of this property at least four times a year. The Mutuals, when they are invited to insure a property, look it over and decline to protect it with their policies unless its construction, protection, equipment, occupancy and management (or housekeeping) condition is brought up to and maintained to their standards; hence their remarkably low fire waste.

The Stock insurance companies and associations (such as the factory insurance associations) which write low-cost insurance follow a similar course and issue a tremendous amount of policies as low as seven to ten cents per hundred dollars on like property. The bulk of property in cities, however, is of such a character that the Mutuals will not write it; but the Stock companies do write it, and without any demand that it be bettered, protecting themselves after inspections merely by charging a higher rate—averaging $1 per hundred all over the country, and running up as high as $10, or 10 per cent. The broker (who averages the unreasonably large commission of 20 per cent. of all Stock insurance premiums collected all over the country) naturally does not favor lower rates.

The course advocated in clause (b) above is that the local chamber committees in municipalities all over the country should inspire the local government to take control of this situation and force reasonable betterment and cleanly occupancy of properties, whether careless and selfish individuals like it or not.

This clause relates more particularly to the local chamber telling its constituent local members how to care for their individual properties in a better way themselves. Each average city property is insured through some insurance broker, on a rating evolved by the local Stock insurance underwriting board. This board looks over the property and draws up its schedule of detail ratings—in the East using the universal Mercantile schedule, made up of two sheets, one "Exposure Hazard" and the other "General"; and in the West using the Dean schedule. These schedules made up by the local underwriting board and handed to the broker are the basis of the charge for the policies from the company, and would tell the owner in each case, if he would look at them, all about the conditions of the property which are charged in the insurance rate.

Therefore, each owner of property should ask his brother to get the insurance schedule, and he ought to study it. If this schedule makes no suggestions as to what physical things can be done to better the property, then the owner should ask his broker to procure from the local underwriting board having jurisdiction a rerating of his property. Possibly he will be answered with the intimation that it is better to "let sleeping dogs lie," and that a rerating may force attention to defects which would be condemned. If the property owner wants to make any progress in this matter he should nevertheless ask for the rerating and get specific, up-to-date knowledge of the physical defects of his property, if any exist.

These defects when listed will disclose certain credits in the insurance rate which would be allowed the owner if the improvements are made. This will give the owner all the elements of the proposition. He knows the amount of insurance he carries and the existing rate. He can get bids on any new work necessary and find out the cost of making the changes. He will be informed as to the reduction in rate the changes will produce—all of which will tell him promptly the total expenditure required to make the change and the total amount he can save by so doing. If the property owner concerned can afford the expenditure, and if this is justified on its financial merits, then the work should be done, the reduction of fire hazard accomplished, the reduced insurance procured, and the property kept cleaned up. All of this will result in not only a better individual fire hazard of life and property but in the aggregate in a better communal fire hazard, and will produce in any city more humanitarian and more sanitary living conditions.

A recent instance here disclosed that an old residence having an insurance rate of 10 cents per hundred dollars was turned into an office building with multiple tenancy; whereupon the rate was lifted to 73 cents per hundred dollars. The owner demanded the information above outlined and discovered that if $35 was spent in improvements the rate could be reduced 30 cents per hundred dollars—applied to a total insurance of building and contents of approximately $100,000; or, in other words that $35 spent in improvements produced a saving of $300 per annum in the insurance bill. Could any course be more rational than that every owner should learn these facts for every property in every city and apply them in practice without governmental compulsion?

Will you kindly procure from the Stock underwriting bureau or association having local jurisdiction duplicate copies of such schedules in blank and send them to me here for our file?

The above is a brief outline of the suggested course of action for chamber members, many of whom may already in some form be doing virtually the same work. It has been impossible in briefer language to make clear the above proposition. Your prompt and earnest attention in detail is requested on the above matter so that a campaign of work can be outlined to organize the above effort in coöperation with this Central Fire Waste Committee at this address.

Yours truly,

FIRE WASTE COMMITTEE

POWELL EVANS, *Chairman*
GEORGE H. HOLT
ANDREW C. IMBRIE
HENRY J. DAVIES
FRANCIS M. CARROLL

ADDENDUM 2

MR. POWELL EVANS, *President*
Merchant & Evans Company
517 Arch St., Philadelphia

DEAR SIR:

I beg to acknowledge receipt of your favor of the 9th instant, in reference to decree of the Court in the case of the Commonwealth of Pennsylvania vs. the Allegheny County Board of Fire Underwriters, and would say in reply that the decree of the Court so far as it relates to the publicity of ratings, is as follows:

"(1) In all risks within the territory of said Board, subject to schedule rating, which may be hereafter rated or upon which the rate may be changed, ascertain an adequate and reasonable rate to be computed by applying the provisions of the proper schedule, as adopted by said Board, to the survey or resurvey of said risk, noting thereon in cents or percentage, the amounts added to the adopted key rate for specified charges or penalties, or both, in the particular risk under consideration, and in like manner the amounts deducted from the gross rate thus computed for specified credits or allowances; thereby ascertaining and stating on said survey and makeup of rate the net rate considered an adequate and reasonable rate for said risk.

(2) One copy of such survey, with said key rate, charges, penalties, credits and allowances and net rate noted thereon, made up substantially in the form of Commonwealth's Exhibit No. 5 in this case (being the survey and rate upon the premises at 625 Liberty Avenue) shall be kept on file in the office of said Board of Fire Underwriters of Allegheny County, and shall during ordinary business hours be open to the inspection and examination of each and every member of said Board of Fire Underwriters of Allegheny County (and to the inspection and examination of each and every owner of property insured by or through any insurance company, a member or represented in said Board, or by or through any member of said Board).

(3) Each and every survey and makeup of rate heretofore made up and now on file in the office of said Board of Fire Underwriters of Allegheny County, shall likewise be open to the inspection and examination of each and every member of said Board (and to the inspection and examination of each and every owner of property insured by or through any member of said Board).

(4) Whenever hereafter any rate is made or changed on any risk within the jurisdiction of said Board, a full and true copy of the survey or resurvey of said risk, with the key rate and all charges, penalties, credits and allowances and net rate plainly noted thereon, and made up substantially in the form of said Commonwealth's Exhibit No. 5, shall forthwith be handed or mailed to the owner or owners of the risk described in said survey and subject to such rate, and said schedule and makeup of rate shall contain in a conspicuous place and in large type a notice to the owner or owners of the risk covered thereby directing attention to the charges and penalties, if any, included in the rate established for said risk, and giving notice to said owner or owners that said rate may be

reduced by correction of the defects or faults of management for which charges or penalties have been made or inflicted in making up said rate."

As stated to you recently, the Deputy Attorney General of the State required that the Philadelphia Fire Underwriters' Association rearrange its by-laws so as to comply with the provisions of the decree. I am enclosing herewith a copy of the revised by-laws which were adopted by the Association at its last annual meeting. These by-laws were submitted to the Deputy Attorney General and approved by him.

REVISED BY-LAWS (PHILADELPHIA)

"Section 4 (B). In all risks within the territory of the Association subject to specific and/or schedule rating which may hereafter be rated, or upon which the rate may be changed, the Committee shall ascertain an adequate and reasonable rate to be computed by applying the provisions of the proper rule and/or schedule as adopted by the Association to the survey or resurvey of said risks, noting thereon in cents or percentages all amounts added to the adopted minimum or basis rate for specified charges or penalties, or both, in the particular risk under consideration, and in like manner the amounts deducted from the rate thus computed for specific credits or allowances, thereby ascertaining and stating on said survey and makeup of rate the net rate considered as an adequate and reasonable rate for said risk.

Section 4 (C). One copy of such survey and schedule or makeup of rate, with said minimum or basis rate, charges, penalties, credits or allowances, and net rate noted thereon, shall be kept on file in the office of the Association and shall, during ordinary business hours, be open to the inspection and examination of each member of the Association and to every broker holding an Association broker's certificate, and to the inspection and examination of each owner of property insured by or through any company, a member of or represented in the Association. The Committee shall make reasonable regulations to prevent the abuse of this right to inspect and examine surveys and the detail of rates and of legal offices.

Section 4 (D). Whenever hereafter any rate is made or changed on any risk within the jurisdiction of this Association, an exact copy of the schedule or method used in the makeup of such rate with minimum or basis rate and all charges, penalties, credits and allowances, and net rate plainly noted thereon, shall forthwith be handed or mailed to the owner of the building, or his authorized representative, when the name and/or address of the owner is known to the Association, and also to all occupants, or their authorized representatives, named in the makeup of such rate, said copy of makeup of rate shall have attached thereto, in a conspicuous place, a rider, notice to owner and/or occupants printed in large type directing attention to the charges and penalties, if any, included in the rate established for said risk, also directing attention to the charges and penalies in the makeup of the rate which may be reduced or abrogated upon the assured's satisfactory compliance with applicable suggestions."

You will note that in the end of Section 4 (C), it provides that the Committee (the Executive Committee) shall make reasonable regulations to prevent the abuse of this right to inspect and examine surveys and details of rates, and the rules referred to in this provision of the by-laws have been prepared and have been submitted to the Deputy Attorney General for his approval. As soon as we hear from him they will be promulgated.

It is my belief that in carrying out the by-laws as adopted, the assured will be able to obtain all information necessary for improving his risk and accordingly the reduction in rate if he so desires without taking up the matter with a third party, the broker.

Yours very truly

Chas. A. Hexamer

Secretary

ADDENDUM 3

From Proposed Amendment to the Insurance Laws of Pennsylvania (April, 1911. Introduced, not passed)

"Every association or bureau which now exists or hereafter may be formed for the purpose of making rates of fire insurance on property located in this State shall supply to the State fire marshal on request or permit the State fire marshal to copy from their files reasonable data on the physical condition of properties in this State and the application of their schedules thereto, as now or hereafter may be listed."

NOTE.—The unincorporated insurance bureaus possess practically all the physical data about buildings in the State and the application to these of the insurance schedule ratings (25,000 properties listed in Philadelphia). This data is the accumulation of years; which cost has been included in the expense of administration of the insurance business; which expense has been an item in the determination of insurance premiums which have been collected from the public; hence this data belongs to the public, and hence to the State; hence the State fire marshal should be entitled to this data to guide his office in decisions about properties in detail. The insurance companies do not appear to object to this regulation. Any movement to actually better fire waste must start at the property which means the procural of a volume of data about property all over the State in detail. This provision is most important for the practical, effective administration of the fire marshal's office.

NOTE.—The above proposal, which was considered too radical for action less than three years ago, is now virtually the law of the State of Pennsylvania, by virtue of the "Allegheny" decision.—ED.

SPECIAL NOTICE

Under date of April 8th Mr. John H. Fahey, President of the Chamber of Commerce of the U. S. of A., advised the undersigned, *re* resolution adopted by the Chamber at its annual meeting (given on page 355) as follows:

"The resolution embodied in your report referred it to the executive committee of the Board; the Board met here Tuesday, has been in continuous session since, and has just adjourned. This subject, as well as the whole relation of the committees to the work of the organization, came up for discussion. The relation of the Chamber to various National organizations seeking our support was also discussed, and it was the decision of the Board that we could not establish the policy of endorsement by this Chamber of the work of any other organizations. The opinion was unanimous that if we established the precedent of suggesting to members of this Chamber that they affiliate with the National Fire Protection Association, or any other association, it would be almost impossible for us to discriminate and we would be in endless controversy.

"The Board sympathizes heartily with the proposals for reducing the enormous unnecessary loss due to fire but it does not feel that it is wise to single out this one association over which, of course, it has no control, and endorse its program; moreover, the directors doubt if they have any authority to take such a step. * * *

"The Board wishes you to understand that it greatly appreciates your energy in this matter and your devotion to the undertaking. It desires to coöperate in every practicable way and hopes that we can work out some plan which will obviate the difficulties to which I am requested to direct your attention."

POWELL EVANS, *Ch. F. W. Com.*

"Mutual" Uniform Inspection Blank For Use All Over Country

INSPECTION DEPARTMENT
Assoc.
Factory Mutual
Fire Insurance Companies,
Long Distance Tel.
Main 6214.
31 MILK ST., BOSTON, MASS.

FACTORY COPY.
REGULAR INSPECTION.

Hours Time in Mill Yard..........
After Insp'n conferred with..........

Factory of.......... Index No..........
.... Inspected by {..........
At.......... on..........

The condition is indicated by the word under which a line is drawn.

GENERAL ORDER and NEATNESS—Neglected. Fair. Good. Excellent. ....
Combus'le Waste Stock..........removed before night. **Floors**—oil soaked. ....
OILY WASTE—Neglected. Well cared for. **Receptacles**—Scant. Poor. Good. ....
CLOSETS, Etc.—Too many. Mostly disorderly. Neat. ....
STEAM PIPES—Examined. Combustibles in contact. All clear. ....
Heating pipes,—Mostly, all, at side, overhead. ....
FIRE DOORS—Pattern—Defective ....Fair.....Good . Self-closing. ....
..........More needed. Repairs needed. In good repair. ....
ELEVATORS, STAIRS, BELTS—Cut-offs at floors—Poor. Fair. Good. ....
FIRE PAILS—Supply scant, good. Neglected. Well filled. ....
SMALL HOSE—In ....
2½" HOSE—Condition suspicious. Good. Supply—scant, ample. ....
Examined..........tested.......... apparently good..........ft. ....
NOZZLES—Supply scant, good. Mostly. All, poor, good. ....
SPANNERS, Fire-axes, Bars, Ladders, Straps—Supply scant, good. ....
MILL FIRE BRIGADE—Unorganized. Undrilled. Org'zed. Drilled. ....
Probable Efficiency: Doubtful. Fair. Good. ....
WATCHMAN {Service & record} —None. Poor. Fair. Good. Rounds made. ....
NIGHT MEN—In yard available for fire......Sundays......Week days. ....
LANTERNS {Watch & repair} —Open. Risky. Fair. Good. ....
LIGHT—Kerosene. Gas,—retort, gasoline. Electric,—incand, arc. ....
ELECTRIC EQUIPMENT—Old style. Modern. Poor. Fair. Good. ....
FUEL OIL, Gasoline or.......... Well arranged. Dangerous. ....
TOWN STEAM FIRE ENGINES..........in 10 min. ......more in 30 min. ....

AUTOMATIC SPRINKLERS—.......... (Name) ....
Fed from: Tank. Pump.-Auto. gov'n'r. Priv. reserv. Public mains. ....
Pressure: on highest spr. ....lbs. from Pub. Supply, Priv. Resv. ....
On highest sprinkler.......... lbs. from bottom of Tank or ....
Shut off in winter—None. Shut off in.......... ....
Valves shut in winter: Location poor. Doubtful. Convenient. ....
Dry Pipe System .... (Kind of Dry Pipe Valve.) in ....
Arrangement of Pipes: Poor. Fair. Good. Improper circulation. ....
VALVES—Examined. All inside sealed. All found open.......... ....
Inspection Records:—None. Poor. Fair. Good. ....
TANK or Private Resv. ....gals.......... ....empty.......... ....full. ....
Used for: M'f'g. Toilets. Spr. only. Hyds., giving..........lbs. at yd. ....
YARD SYSTEM—Outside shut-offs on all pipes over 2½" enter'g bldgs. ....
YARD HYDRANTS—Con. to Pub. Supply . Old style dry...Frost-proof ....
All examined. Tested..........All apparent good order. ....
FIRE PUMPS—Used objectionably for mfg. Power nights & Sundays. ....
Started how often?.......... Turned over to-day. ....
PUBLIC WATER SUPPLY—Direct pump pres. only. Gravity delivery. ....
Not connected into yard. Gate kept shut. Obstructed by meter. ....
Diam. Main into Yard..........Diam. street main.......... ....
Special fire pres..........lbs. Ord. pres. by day..........lbs. Tested. ....
PROB. NO. GOOD 1⅛" STRMS. all sources (pmp. pblc. & res.) can simultaneously furnish at any point in yard (Include steamers first alarm only.) ....

GRADING AS A WHOLE:

Class of Manufacture.......... **Specific kind of Work**.......... ....
Stock or Storage in mill, more than ordinary for class?..........**Storehouses**—None. All examined. Neat. Sub-division urgent.
Bldgs. **Height** max..........Stos. **Walls** **Floors** **Roofs**
Gen. type of constr.......... mostly..........Stos. mostly.......... mostly.......... mostly..........

These lines not copied as the statement in mill.

Inspector's judgment present conditions at this risk.

Gen. Discipline (Mgt. & help)	Lax	Fair	Good	Excellent
Extent of Mill Sprinklers	None	Scant	Tolerable	Ample
Supply to Sprs. {Primary / Total}	None	Scant	Tolerable	Ample
Pump Service	None	Scant	Tolerable	Ample
Hydrants & Yard Pipes	None	Scant	Tolerable	Ample
Outside Aid {Public dep't or mill near by}	None	Dbtfl.	Fair	Good

Quality as a Fire Risk as a whole at present, compared with best of .... Class

EXPOSURE	Bad.	Consid'ble.	Moderate.	Slight.	None.
CONSTR'C'N		..........Poor.	..........Fair.	..........Good.	..........Excellent.
OCCUPANCY		..........Poor.	..........Fair.	..........Good.	..........Excellent.
PROTECTION		..........Poor.	..........Fair.	..........Good.	..........Excellent.
AS A WHOLE		..........Poor.	..........Fair.	..........Good.	..........Excellent.

Special inspection needed regarding.......... ....

"Mutual" Uniform Inspection Blank—Continued

APPROXIMATE PER CENT. FLOOR AREA SPRINKLED.

Of MAIN MANUF'G BLDGS. including towers, foundries and wet-work, but not detached buildings of slight hazard or small value.

Per cent. of above main buildings where sprinklers are still needed

Of important STORAGE buildings.

Store Houses sprinkled:

....

....

Improvements urgently necessary.

Minor Improvements suggested.

General remarks.

Other important unsprinkled rooms not mentioned above.

Recent changes in sprinklers, protective apparatus, or buildings.

Extent and amount of night work.

PUBLIC WATER PRIV. RESV. OR LARGE TANK.............. 1½ inch streams reduced pressure from ....lbs. to ....lbs. .... gallons. ....streams to .... lbs. Tests made by ....

○ FIRE PUMPS		H. P. available for Pumps from Water Wheel or Boilers.	SIZE.	RATED CAPACITY. Gallons per Min.	GREATEST SPEED TRIED Revs. per Min.	NO. OF STRMS.	SIZE STREAM.	WATER PRESSURE. Lbs. per Sq. In.		LENGTH OF HOSE. Feet.	SIZE OF HOSE.	KIND OF HOSE.	APPROX. GALLONS DELIV'D.	SMOOTHNESS OF ACTION.	GENERAL CONDITION.
LOCATION.	MAKE OF PUMP.							At Pump	At Hyd't						

Rotary Pumps......... Well located, Inside, outside main bldgs. Can be run indepen't of sh'ft'g & belt'g?................ Driven by Friction, Sliding gear.

Steam Pumps.........Well located. Steam plant cut off from main bldgs.?............ Steam pipe safe?......... All steam properly contr'l'd in Boiler R'm?............. Boiler feed reliable?..............

Map, Vol.............................*Sheet*...................................... *Survey No.*..

Board of Fire Underwriters of Allegheny County

SURVEY OF FIREPROOF BUILDING

Location..

RISK		EXPOSURES						
Openings in Wall	op'gs over exp. if adjoining	Distance	Const'r	Street Number	Openings	Opposite	Kind of Shutters	Blank
Front								
Right								
Rear								
Left								

Skeleton Construction ?.. Cast or wrought iron or steel columns built in the walls? ....

Bearing Walls ?.................................. Thickness?.. Poor bricks or mortar?..................................

Stone Walls ?.................................. Which?.................................. Plain?.................................. Axed?.................................. Ornamental?..................................

Columns (Interior) Cast Iron?.. Wrought Iron or Steel?..................................

Are all columns, girders and lower flanges protected?..

How?..

SURVEY OF FIREPROOF BUILDING—Continued

Floor Arches? Brick, segmental terra cotta, concrete on iron centers, Metropolitan, Roebling, expanded metal, Columbian, Bailey, Fawcett, Guastavino, Rapp (flat or curved)?........

.... Width of Arch ....

Floors? Boards on concrete without air space?........ With air space?........

Fireproof surface?........ Which floors and of what?........ Inclined, with scuppers, to carry off water?........

Partitions of wood or plaster on wood lath and studs?........

Stone Piers, cap or bond stones? (Number, size, supporting what?)........

Height........Story, Bast.........Sub. Bast.........**Area**........x........=........

Skylights? (Monitor, frame, size, thickness) Over openings?........

Extension........ Main Building........

Roof Structure of frame?........

Fire Shutters? (Kind, condition, location?)........

Communications? (Character, location, open or protected?........

Fire Doors at communications? (Construction, hanging, sills, condition)........

Lighting, Electricity........ Gas........ Kerosene........ Open lights in show windows........

Swinging Brackets? (Number and location)........

Unprotected wood-work or stock exposed ....

SURVEY OF FIREPROOF BUILDING—Continued

Power? ....

Heat used in Manuf'g? ....

Benzine, Naphtha, Rubber, Cement, Gasolene? (quantity, where used and in what kept, report under occupancy) ....

Paints, Oils, Varnish, Turpentine, Alcohol, Ethers, etc. (quantity, where used and in what kept, report under occupancy) ....

Dry Rooms? (For what, construction, heating, safely arranged?) ....

Self-closing Cans for oily waste, rags, etc.? ....

Ash Cans? ....

Drip Pans for oil? ....

Cuttings, Papers, Sweepings, etc. (Disposition) ....

Packing Material? (Quantity, where and how kept) ....

Bottom of Shafts used for closet or waste? .... Sawdust on floor and spittoons? .... Floor sprinkled with oil? ....

Untidiness? (Also as to yards, under sidewalk, gratings, etc.?) ....

Crowded? (With proper aisles. Too near window. State floors?) ....

Automatic Alarm? ....

Special Building Signal? .... Chemical engine on wheels? ....

Watchman? .... When? .... Rounds? .... Clock? .... Station? .... Records? ....

Fire Buckets? S. B. ...... B ...... 1 ...... 2 ...... 3 ...... 4 ...... 5 ...... 6 ...... 7 ...... 8 ...... 9 ...... 10 ...... 11 ......

12 ...... 13 ...... 14 ...... 15 ...... 16 ...... Good condition? ...... Well placed? ......

Automatic Sprinklers? .... Perforated pipes, location and supply? ....

Standpipe, Internal? (No., size, location, supply, size, length, kind and condition of hose each floor, attached and with nozzle?) ....

Standpipes, with external Siamese? (Size, location, outlet each floor and roof?) ....

SURVEY OF FIREPROOF BUILDING—Continued

Roof Hydrants (No., size, supply, hose, housed) ....

Pumps for fire use? (Location, kind, size, supply?) ....

Fire Dept., adjoining .... Opposite .... 300 ft.? .... Fire Boat? .... Hydrants within 300 ft.? ....

Elevators ? (Number and how arranged? In same opening with stairs or adjoining? If in F. P. shaft describe protection at openings) ....

Motor or engine in F. P. room? .... How cut off from shaft? ....

Stairways ? (Number and how arranged? If in F. P. shaft describe protection at openings) ....

If any of fireproof construction describe? ....

Stone treads and landings? .... Iron plates under stone? ....

Well-holes ? (Number, location, size, floors pierced) ....

NOTE: Give particulars if the following floor openings are adjoining or near elevators or stairways:

Chutes, Belt-holes, Channels, etc.? (Floors pierced and arrangement) ....

Dumb-waiters ? (Location, floors, pierced and arrangement) ....

Light or Vent. Shaft? (Number, location and construction) ....

OCCUPANCY

Report all tenants (including sample stock) except offices. Full particulars as to mixed stocks, work done, processes, machinery used, number of hands, etc. If Public Warehouse, Bonded or Free? Private Warehouse, original unbroken packages, sales by sample only, delivery of broken packages?

....

....

Date .... Surveyor

Cased and Package Goods on Skids 6 in.	Covered by Tarpaulins	In Water-tight Cases

Map, Vol.........................*Sheet*........................ *Survey No.*........................

Board of Fire Underwriters of Allegheny County

SURVEY OF NON-FIREPROOF BUILDING.

Location..

RISK		EXPOSURES						
Openings in Wall	op'gs over exp. if adjoining	DISTANCE	Height and Const'r	STREET NUMBER	Openings	Opposite	Kind of Shutters	Blank
Front								
Right								
Rear								
Left								

Walls	Brick	Stone	Iron not Backed	Iron Backed	Hollow Iron in Row	Wood	Glass	Indep.	Party	PARAPET?		THICKNESS—report ledges or projections							Poor Bricks or Mortar?
										Height?	Coped?	1	2	3	4	5	6	7	
Front																			
Right																			
Rear																			
Left																			

Height........................Story, Bast.................Sub. Bast.................**Area**.................x.................=........................

SURVEY OF NON-FIREPROOF BUILDING—Continued

Bk. Div. Walls?

	Side Accessible	Fire Escape	MANSARD	SHUTTERS—Kind and Condition	COMMUNICATIONS?		
					Character	Floors	Open or Protected
Front							
Right							
Rear							
Left							

Fire Doors at communications? (Construction and Condition)

Roof **Roof Space?** Shaft or openings into same?

Floors Fireproof floors Construction?

Beams, less than 3x10 inches Beams, self-releasing?

All story posts girders, beams 12x12 inches? (*Describe*)

Tin, sheet iron, or waterproof paper between floors? Inclined waterproof floors with scuppers?

Ceiling (wood, cloth, paper) S B 1 2 3 4 5 6 7

Side Walls (wood, cloth, paper, furred?) S B 1 2 3 4 5 6 7

Metal Lath and wood or iron stud?

Skylights? (Monitor, size, thickness, frame) Over openings?

Extension Main building

Cornice Wood continuous with other buildings

Cupolas, Dormer windows? **Wires?** Location

Wood Awnings? **Frame Ext.?** (Height, size)

SURVEY OF NON-FIREPROOF BUILDING—Continued

Stone piers, or brick piers, with bond or capstones (number, size supporting what?) ....

Iron Columns, etc. Unprotected columns (cast or wrought) or girders, number, what supporting? ....

NOTE: Give full particulars of all floor openings, stating distance from one to the other

Elevators? (Number and how arranged. In same opening with stairs or adjoining?) ....

Stairways? (Number and how arranged. State if stone or iron. If office or dwellings above grade, does stairway from street communicate with store?) ....

Hoist or Hatchways? ....

Well-holes? (Size, floors pierced) ....

Light and Vent. Shafts? (floors pierced and arrangement.) ....

Dumb Waiters? (floors pierced and arrangement.) ....

Chutes, Belt-holes, etc.? (floors pierced and arrangement.) ....

Age .... **Condition,** (Broken floors, windows or plaster exposing lath, etc., etc.?) ....

Lighting, Electricity .... Gas .... Kerosene .... Open gas lights in show windows ....

Unsafe swinging brackets or unprotected wood-work or stock exposed? (Number, location and arrangement) ....

Have arc lights tight globes or spark-arresters? ....

Heating? .... Wood or metal cold air box to furnace? .... Steam pipes safe? ....

Chimney, less than 8 inches thick? .... For what used? .... Good condition? ....

Bracketed or from ground? .... On attic floor beams? .... Floors under and in front of stoves protected? ....

Stove Pipes .... Through roof, floors, partitions, windows or wall? How arranged? ....

.... Enter bottom of flue vertically or flue in attic or unused room? ....

Boiler? .... Used for .... Location how cut off? .... wood-work .... in. distant

SURVEY OF NON-FIREPROOF BUILDING—Continued

Power? ...... **Ash Cans?** ......

Heat used in Manuf'g? ......

Benzine, Rubber Cement, Gasolene, Paints, Oils, Varnish, Turpentine, Alcohol, Ethers, etc.? (quantity? where used and in what kept. Note floor here and give full report under occupancy)

Dry Rooms? (For what, construction, heating, safely arranged and clean?) ......

Self-closing Cans for oily waste, rags, etc. required? B......1......2......3......4......5......6......7...... **Drip pans** required? B...... 1......2......3......4......5......6......7......

Cuttings, Papers, Sweepings, etc. (Disposition and receptacles) ......

Packing material? (Quantity, where and how kept?) ......

Bottom of Shafts used for closet or waste? ...... Sawdust on floor and spittoons? ......Oily floors? ......

Untidiness? (Also as to yards, under sidewalk gratings, etc.?) ......

Crowded? (Without proper aisles. Too near windows. State floors.) ......

Fire Buckets? S......B......1......2......3......4......5......6......7......Good condition? ......Well placed? ......

Watchman and/or Special Building Signal? ......Which? ......When? ......Rounds? ......Clock? ......Stations? ......Records? ......

Automatic Alarm? ...... **Chemical Engine on Wheels?** ...... **Burglar Alarm?** (partial or throughout?) ......

Standpipe, Internal and or External? (No., size, location and supply, size, kind, length and condition of hose each floor, attached, and with nozzle?) ...... **Roof Hydrants?** (No., size, supply, hose, housed?) ......

Pumps for fire use? (Location, kind, size, supply?) ......

OCCUPANCY.

Report all tenants by name (including sample stock) except offices. Full particulars as to mixed stocks, work done, processes, materials and machinery used, number of hands, etc. If Public Warehouse, Bonded or Free? Private Warehouse, original unbroken packages, sales by sample only, delivery of broken packages?

Goods on Skids 6 in.	In Water-tight cases	Occupancy Charges Item Nos. and Am'ts

REMARKS: ......

......

Date ....Surveyor

NOTE.—Diagram of risk must be drawn to scale on this page.

The foregoing schedules of **"Fireproof" and "Non-Fireproof" Brick Buildings** both carry the following rider, viz:

"NOTICE

If defects $^{\text{and}}_{\text{or}}$ faults of management exist in the property rated under this schedule, the rate may be reduced by complying with the suggestions herein.

Board of Fire Underwriters of Allegheny Co.
(Pittsburgh, Pa.)"

SCHEDULE

(Used with "Fireproof Survey")

Board of Fire Underwriters of Allegheny Co.

FIREPROOF BUILDINGS

Map..............................**Survey No.**..............................

Location..

....

....

....

....

FULL SURVEY

....

....

....

OCCUPANCY—IMPROVEMENTS

....

....

DETAILS OF FLOOR OPENINGS

....

....

....

FIRE-PROOF SCHEDULE–BUILDING

No

KEY RATE OF PITTSBURGH PROPER .20; North Side .30; South Side .35.

287 Average thickness of two side or bearing walls (or either of them) less than twenty inches (obtained by adding thickness of various stories and dividing by the number), charge for each inch of deficiency .01; if any portion of wall less than twelve inches, double the charge; (if built according to Pittsburgh Building Code no charge)........................

288 For each wall of stone or veneered with stone ashlar; plain or "axed" finish, glazed tile, terra cotta, charge .02; if carved or ornamental, .03..

UNPROTECTED IRON. 290—If columns and lower flanges of metal members unprotected (½ charge for office buildings) charge as follows: For unprotected columns .15; for unprotected lower flanges of beams .02.

AREA. 293—5,000 sq. ft. to 10,000, each 1,000 in excess of 5,000, ¼ of .01..

294 If over 10,000 sq. ft. each 1,000 in excess of 10,000, .02....

(Not exceeding a total of .50).

(If building occupied exclusively above grade floor for offices* or dwellings, no charge for area).

(Note.—If mercantile buildings exceeds twelve stories, double area charge).

294a Wooden partitions or plaster on wooden studs and laths .05.

HEIGHT. 295 (......Stories). For each story over eight up to twelve, charge .01..

296 Twelfth story and each story over twelve up to fifteen .03...

297 Fifteenth and each story over fifteen, charge .10..............

(Office buildings * charge one-fourth height charges.)

297a If merchandise stored above seventh floor, charge 10 cents, and add 2 cents more for each floor above seventh up to tenth, and 5 cents more for tenth and each floor above tenth. For example, an eleven story building would have 24 cents added. No charge for sample stocks and only one-half charge for stocks whose first column charge is less than 10 cents.

FLOORS. 298—Wooden floor boards laid solid on concrete without air space .05, if with air space .10, (office buildings * one-half ....

FLOOR ARCHES. 298a—With reinforced concrete, terra cotta tile or brick no charge; if otherwise .04........................

If on exposed corrugated iron centres .05. If flat arch supported on iron (such as Rapp's flat type) .08. If space between iron floor beams exceeds 5 feet, for each foot in excess .01..

N.B. One-half these charges in office buildings.

ELEVATOR. 299—Not cut off according to standard, but in hallway or enclosed court, etc., .06 (office buildings charge .02)..

299a If provided with approved automatic traps or doors at each floor charge .03..

(No allowance can be made for hand traps).

300 Open, .12 (office building, charge .04)........................

301 Enclosed in wood and glass .20 (one-half charge for office building) ....

(Note—If elevator and stairway in one shaft or opening, one charge for the two. For each additional elevator not cut off add .02).

STAIRWAYS. 302—Not cut off except by wooden lath, plaster block or plaster hallway, etc., .10........................

302a If provided with automatic traps or doors at each floor, charge .05..

302b If enclosed by brick or tile hallways, but doors not iron or metal covered, or if lights in panels are not wired glass, or otherwise fire resistant charge .04. If stairs in latter case be fireproof with iron treads charge .02........................

303 If enclosed in wood and glass, .20 (one-half charge in office building) ....

304 Open, charge 1 cent each floor not exceeding a total of .14 in mercantile building and .04 in office building................ (One-half charge for 302, 302a, 302b, 303 or 304 if charge has been made for 299, 299a, 300 or 301.) For additional stairway no charge. Stairway and elevator same shaft or opening, one charge for the two.

305 If at least one stairway is not fire-proof with metal treads under slate or marble treads (which will yield to fire), charge as many times .02 as the building has floors (one-third charge for office buildings.) If stairway in fire-proof hall or enclosure protecting stone treads from heat one-half final charge.

WELL-HOLES, ETC. 306—Open for each floor pierced, .03........ (Half charge for office building.)........................

WOODEN CHUTES, VENTILATING SHAFTS, DUMB WAITERS, INTERIOR COURTS, CHANNELS FOR PIPING OR ELECTRIC WIRES, ETC., 307—Each floor pierced, one cent.

Note—No charge need be made for openings for steam and water pipes if the space around the pipes is filled in with mineral wool, asbestos or other incombustible material, or otherwise arranged to prevent draughts and prevent leakage of water to floor below.

SKYLIGHTS. 308—Exceeding nine square feet, for each nine square feet (not exceeding total of 10), .01.... .. ..

309 If covered with strong wire netting, one-half charge... ......

STREET. 310—If street on which building fronts is less than sixty feet wide but over fifty (unless opposite side vacant), .01..

311 If under fifty feet, for each five feet under fifty, .01..........

NUMBER OF TENANTS. 313—Each in excess of one, exclusive of office and dwelling tenants, ¼ cent................ ....

MANUFACTURING RISKS. 313a—Charge .01 for every 20 operatives employed in excess of 20 not exceeding a total of 10 cents where first column charge does not exceed 25 cents, and double this amount for those tenants whose first column charge exceed 25 cents, but not exceeding a total of 25......

STONE Piers, stone columns, pillars, or brick piers with bond stones or cap stones. 315—carrying important weights, especially if supporting beams or girders in basements, cellars, etc., charge according to number, not less that .02..............

TOTAL...... ....

EXCEPTIONAL CONSTRUCTION—For fire-proof floor surfaces of cement, concrete or asphalt deduct 5 per cent.... ....

If floors inclined for carrying off water with scuppers 2 per cent. ....

METAL TRIM THROUGHOUT, deduct 5 per cent... . ....

320 **RESULT CARRIED FORWARD**...... ... .

*Office buildings include partial occupancy by sample stocks or small restaurants or grade floor stocks whose first column charge is less than 15 per cent.

Schedule Fireproof Building—Continued

FIRE-PROOF SCHEDULE—BUILDING

320 RESULT BROUGHT FORWARD..

Add for occupancy—(25 per cent. amount in first column of table, Selecting charge for most hazardous occupancy.) Increase charge 5 per cent. of its amount for each story on which most hazardous occupancy is located above second. No..

322 RESULT ....

	DEDUCTIONS FOR FIRE APPLIANCES, ETC., ON BUILDINGS.	No.	$	cts.
343	Auto. fire alarm to central station 10 per cent. to 10 cents..................			
344	Standpipe, near stair landings with external siamese street connections for use of fire dept., 5 per cent..................			
345	Standpipe, internal with tank supply, 1 per cent..			
347	Automatic sprinklers below grade, with city main or tank connection, 10 per cent. Dry line sprinklers 3 per cent. (No deduction if allowance has been made for sprinklers throughout building.)			
	For Partial sprinkler equipment allowance, except as above, consult Board.			
348	If building occupied exclusively for offices or dwelling, or both, 20 per cent..................			
349	If occupied exclusively for offices or dwellings, or both, above grade floor, 10 per cent..........			
350	Roof hydrants, 1 per cent..................			
352	Watchman with clock, 2½ per cent. to 2½ cents. Special Building Signal 5 per cent. to 5 cents.. Without watchman and clock 2½ per cent. to 2½ cents..................			
353	Auxiliary Private Fire Plant, Force Pump, etc., available for day, night and holidays; standpipe, hose attached at each floor; competent engineer on hand at all times, deduct 5 to 10 per cent..................			
354	FIREBOAT. If risk within 800 feet of Fire Boat, 5 per cent..................			
355	Casks of water or sand or filled pails (two filled pails to each 1,000 sq. ft. of floor area), 5 per cent.................. Note—(Approved Extinguishers accepted in lieu of pails.)			
	Total Deductions..........		$ &	c.

RESULT. Rate on building occupied, unexposed..

323 EXPOSURE ....

324 RESULT. Rate on building, occupied and exposed..

324a SPRINKLERS. If according to Board requirements deduct.....$......

325 CO-INSURANCE with......$ rate..

	ADD FOR FAULTS OF MANAGEMENT IF ANY.	No.	Chge.
380	If bottom of elevator shaft used for oil, coat or other closets, .10..................		
381	Swinging or other unsafe gas brackets or bracket lamps, within 36 inches of combustible ceilings, etc., for one, .05; for each additional, .01......		
382	Untidiness, rubbish, ashes, etc., especially in cellar, .10..................		
383	Empty boxes rear yard, alleys, etc., .02..........		
384	Lights in show-windows, open, unprotected, .05..		
385	Sawdust spittoons or sawdust on floors, .05.......		
386	Kerosene used to sprinkle floors, .10............		
387	Ash and waste cans not metal, .10............		
388	Electric light system and installation not in compliance with underwriters' rules, or arc lights unprotected, .25..................		
389	Crowded Mdse. without proper aisles opposite or too near windows, not less than .05...........		
	Sign on roof to interfere with Fire Department.		
	Communications until approved by Board......		
	Unsafe Electrical Apparatus..................		
	Unsafe Heating Apparatus..................		
	....		
	....		
	....		

FINAL RATE ON BUILDING.

MINIMUM RATE.—No office building to be rated below .12 or mercantile building below .20 after all deductions including co-insurance have been made.

To Obtain Rate In Stock On Fire-proof Building.

Floor..........
Stock..........
Class No..........

RATE OF BUILDING at No. 320..............................

Add 75 per cent. rate named in second column of occupancy table...

Add 25 per cent. the amount named in the first column for the stock to be rated..............................

Add; in case there be any other occupancy of building which increases the rate of the building by a greater amount named for the first column of the occupancy table than the risk to be rated. one-quarter the difference between such higher figure and that named for the risk..............................

If the higher rated or excess hazard be separated from the stock to be rated by fire-proof partitions or floors, deduct 10 per cent. of the excess charge for each separating fire-proof floor or partition, not exceeding seventy per cent in all, of such excess.

IF MERCHANDISE IS STORED ABOVE THE SEVENTH FLOOR, add to the rate of each stock in the building, no matter on what floor located, as many times 1 cent as the building has stories in height. (For example,, in a 10-story building occupied throughout for mercantile purposes, 10 cents would be added; in an 11-story building, 11 cents, etc.)

STOCKS ABOVE OR BELOW GRADE FLOORS.—Charge as many times 5 cents as the floor on which stock is located is stories above the fourth or below the grade. If distributed over two or more floors for same assured, and with 80 per cent. co-ins., and cut offs standard each story, three-fourths of average charge.

For example, merchandise on the fifth floor should pay 5 cents; on the sixth floor, 10 cents; seventh floor, 15 cents, on all 30 cents, average 10 cents, three-fourths of which 7½ cents (if cut offs standard each story) is the proper charge for same stock covering these three floors.

Grade Floor Stocks.—Deduct for stock entirely on grade floor, 20 per cent; if on second deduct 10 per cent; if on grade and second deduct 10 per cent; if on basement and first 5 per cent.

DEDUCTIONS FOR FIRE APPLIANCES, ETC., ON STOCKS.	No.	$	cts.
361 If merchandise covered by tarpaulin covers, each night, 5 per cent....................			
362 Proximity to fire department station, hose or hook and ladder house, if risk within 300 feet, 2 per cent.; if next door or on opposite side of street, 5 per cent			
363 Basement and sub-cellar sprinklers, if goods on skids, 2 per cent...................			
364 Automatic sprinklers in basement (no deduction if allowance has been made for sprinklers throughout building), 10 per cent.			
For Partial sprinkler equipment allowance, except as above, consult Board.			
365 Casks of water or sand or filled pails (2 filled pails for each 1,000 square feet floor area) 5 per cent...			
Note—(Approved extinguishers accepted in lieu of pails.)			
367 If building occupied entirely above grade floor for offices, 5 per cent..............			
368 If building occupied entirely for offices and dwelling, 10 per cent.....................			
370 Watchman with watch-clock 2½ per cent. to 2½ cents. Special Building Signal 5 per cent to 5 cents. Without watchman and clock 2½ per cent. to 2½ cents..............................			
371 Standpipe, internal, near stairs with tank supply, 1 per cent........................			
372 Standpipe, with external siamese connection at street for use of fire department, 5 per cent.			
373 If one or more chemical engines on wheels, 3 per cent..................................			
374 Auto. fire alarm to central station 10 per cent. to 10 cents..............................			
375 SKIDS. If merchandise in bales or unopened cases or similar original and unbroken packages is kept on skids or platform 6 inches high, deduct 2 per cent..........			
377 Floors arranged for carrying off water with scuppers, 5 per cent.....................			
378 FIREBOAT. If risk within 800 feet of Fire Boat, 5 per cent............................			
Total Deductions........		$ &	¢

RESULT—Rate on stock unexposed..............................

EXPOSURE ....

829 RESULT—RATE ON STOCK EXPOSED..................

SPRINKLERS deduct... ....¢..........................

830 DEDUCT FOR CO-INSURANCE, if policy covers only one or more floors not cut off 15 per cent.
If cut off the following table applies:

Stock Distributed over	Wood doors	Non-Standard fire doors	Standard doors
2 floors	16⅔%	18⅓%	20%
3 "	18⅓%	21⅔%	25%
4 " or more	20 %	25 %	30%

831 RESULT—Rate on stock with 80 per cent. co-insurance..........

ADD FOR FAULTS OF MANAGEMENT, IF ANY..................

FINAL RATE ON STOCK.

MINIMUM RATE.—No stock to be rated below 80 cents after all deductions including co-insurance have been made.

SCHEDULE

(Used with "Non-Fireproof Survey")

Board of Fire Underwriters of Allegheny Co.

NON-FIREPROOF BRICK BUILDINGS

Map...**Survey No.**...

Location..

....

FULL SURVEY

....

....

....

....

OCCUPANCY—IMPROVEMENTS

....

....

....

....

....

....

DETAILS OF FLOOR OPENINGS

STANDARD BUILDING under the schedule is one having walls of brick or stone (brick preferred), not less than twelve inches thick at top story (16 inches if stone), extending through and 24 inches above roof and parapet and coped, and increasing four inches in thickness for each story below to the ground, the increased thickness of each story to be utilized for beam ledges. Ground floor area not over 2,500 square feet; height not over four stories, or 50 feet; floors of 2-inch plank covered by ⅞ or one-inch flooring, crossing diagonally, with waterproof paper or approved fire resisting material between, wooden beams, girders, and wooden story posts or pillars twelve inches thick, or protected iron columns; elevators, stairways, etc., cut off by brick walls, communications at each floor protected with approved tin-covered doors and fire-proof sills; windows and doors on exposed sides protected by approved tin-covered doors and shutters; walls of flues not less than eight inches in thickness, to be lined with fire-brick, well-burned clay or cast-iron, and throat capacity not less than 96 square inches if steam boilers are used; all floor timbers to be trimmed at least four inches from outside of flue; heated by steam; lighted by gas; cornices of incombustible material; roof of metal or tile; if partitions are hollow or walls are furred off there must be fire stops at each door.

WALLS.—A STANDARD INDEPENDENT WALL under the schedule should be 13 inches at the top story, and increase four inches for each story to the bottom. This would require if three stories, 12 plus 16, plus 20, total 48, divided by three, or an average of 16 inches; a 4-story standard wall would average 18 inches; 5-story, 20 inches; 6-story, 22 inches; 7-story, 24 inches, etc. (Stone walls must average 4 inches thicker each story.)

A STANDARD PARTY WALL under the schedule should average for a 3-story building 20 inches, 4-story, 22 inches; 5-story, 24 inches; 6-story, 26 inches; 7-story, 28 inches. (Stone walls must average 4 inches thicker each story.)

Walls under Pittsburg Building Code may be regarded as standard.

(If elevators are provided with traps which are not automatic, or traps closed only at night, NO DEDUCTION CAN BE MADE FOR THE SAME.)

Schedule Non-Fireproof Brick Building—Continued

KEY RATE OF PITTSBURGH PROPER .20; N. S. .30; S. S. .35.

WALLS. 38 Indep't, each 4 in. variation from stand...........01
(Buildings over 4 stories high double charge)..............
39 On Buildings over 3 stories if average 12 in. or less add in addition to above not less than 01. (If 2 independent walls adjoin deduct 4 inches from average requirement)........
Party Walls 40—Each two inches deficiency from st'd....01
If over four stories double charge........................
41 If less than 12 inches in any part add not less than......05
Charge for one wall only, the most deficient.
42 Walls not Parapet 12 inches above roof and coped each exposed side 03
43 Poor Bricks or poor quality mortar.........................10
44 Each Iron Front or side not backed with br. & mor........03
45 Iron Fronts backed up with brick and mortar...............01
46 Each Iron Front in group add in addition to above..........01
46½ Stone Front or side, each...................................03

ROOF. 47—Composition (other than standard).....................01
48 Slate 02
49 Shingle 08
50 Mansard with wooden frame, four story or lower, one side..07
51 Each additional side .03. Increase charge 5 cents for each story over four...
52 Roof space, blind attic each vertical foot .01, not over....05

FLOORS. 53—Double Flooring less than 3 inches thick.........02
54 Single Flooring 05
55 Floor Joists less than 2x10 inches...........................03

CEILING OR SHEATHING. 56—Wood or Strawboard ceiling or wooden lath furring on walls each story......................01
57 Wood or Strawboard siding one story .02; each add..........01
57a Cloth or paper ceiling or siding on wood studs, each story..05
59 AREA each 1000 sq. ft. in excess of 2500 sq. ft. add..........03
Limit 6 story or under 1.00 over 6 story 1:50. Sole tenant 20% off.
(Deduct 10% of area charge for each division wall, not exceeding 40% of area charge)..............................

HEIGHT. 63—.........Stories—Fifth Story............................03
64 For Sixth Story...05
65 For Seventh Story .12, each story over seven .15, (cumulative) ....
(Standard building may be Seven Stories without charge.)

ELEVATORS 67—Cut off by lath and plaster hallway or shaft with self closing doors or automatic traps..................03
67a Cut off by brick or fireproof shaft but doors not standard, or with wood sills, or if windows in shaft are not wire glass or otherwise fire-resistant, charge......................02
68 Open 06
69 Wooden Shaft without self closing traps.......................08

STAIRWAY. 71—Cut off by lath and plaster hallway .06, with self closing traps or doors at each floor......................03
71a If stairways are simply provided with traps which are closed only at night, charge...06
71b Cut off by brick or tile hallways, but doors not iron or metal covered, or if lights in panels are not wire glass, or otherwise fire-resistant, charge..................................02
72 Enclosed in wood with self closing doors each floor........05
73 Open 08

These charges for elevators and stairways apply to building four stories or less in heighth. Over four stories add 25% per story to final charge.

(For each extra elevator or stairway add ¼ of charge for each. If both elevator and stairway are charged make full charge for greater amount and half charge for smaller.)

No.	Amt.

WELL HOLES, CHUTES, VENT, SHAFTS AND DUMB-WAITERS. 74—Make full charge for each floor; no allowance for traps which are not automatic in every particular and fit openings closely. For each floor pierced not less than .01 (well holes each floor .05)..............................
75 If dumb-waiters are in brick shaft, but the doors to floors are not metal-lined, deduct only 50% from charge.

SKYLIGHTS. 76—Not standard each 9 sq. ft. over 9, .02; not over 15

WOODEN CORNICE, CUPOLAS, ETC. 79—Not less than.....02
80 Wooden awnings on one-story bldgs. .05, on higher bldgs...01
86 Kerosene 01

HEATING. 87—Furnace .02, if metallic cold air box...............01
89 Stoves (if 87 and 89 only charge for greater)...................01

CHIMNEYS. 97—Not built from ground but on brackets........05
99 Resting on attic floor beams or joists..............................15
100 Only one-half brick thick (4 inches) .12 (if stoves only)...03
Half charge only for chimneys 4 inches thick which are used for small stoves connected with the same by pipe of some length, but full charge to be made if used for furnaces, boilers, large laundry stoves, large ranges, etc.
No charge for a 4-inch chimney properly lined with cast-iron or terra cotta pipe.
101 Poor bricks or mortar (in add. to bldg. charge No. 43)....10

WIRES. 102—Overhead around bldg. to interfere with fire dept..01
105 Electric Trolley Wire to interfere with fire department...02

TENANTS. 106—Each mercantile tenant in excess of one tenant 01
106a Each Manufacturing tenant in excess of the highest rated one (which is charged for in No. 128) add twenty per cent. (20%) of first column charge.
106b MANUFACTURING RISKS.—Charge 1-10 of .01 for each operative employee in excess of 10, maximum .25 except where the first column charge exceeds .25, then double this charge, maximum 1.00.

SMALL PART FRAME. 108—Except as provided for under 50. 51, 79, 80..................not less than.............................05

STONE PIERS, STONE COLUMNS, PILLARS, or brick piers with bond stones, unprotected, 109—not less than..03
110 Unprotected metal columns or girders............................05
111 STEAM BOILER (except for heating) inside first floor or basement .05, upstairs .10, Wood shavings for fuel 1.00......

First Total...

DEDUCT FOR EXCEPTIONAL CONSTRUCTION:

	No.	%
119 Tin or Sheet Iron between floors....................10%		
120 Waterproof paper between floors.........................5%		
121 Floor waterproof inclined to carry off surplus......5%		
122 Grade floor fireproof 10%. Each additional floor 5% (not exceeding 40% in all)......................................		
123 Metallic stud and lathing or tile partitions throughout 10%		
124 Metallic lathing on wooden studs, terra cotta or other fire resisting partitions...............................5%		
125 Mill construction..................................5% to 25%		

127 RATE ON BUILDING UNOCCUPIED.................

Schedule Non-Fireproof Brick Building—Continued

127 RATE ON BUILDING UNOCCUPIED (Brought Forward)..........

Occupied by Nos...

127a Add 50% of amount in first column for most hazardous occupancy...

128 RATE ON BUILDING OCCUPIED.. ... .

DEDUCTIONS FOR FIRE APPLIANCES ETC., ON BUILDINGS.	No.	%	cts
158 Automatic fire alarm.................10% to 10 cents.			
158a " burglar alarm..... .... .1%			
159 Chemical Engine on wheels.......................5%			
160 Iron fire escapes on accessible side with landings each floor............. ....2%			
161 Casks of water or sand or filled pails on each floor (2 filled pails for each 1,000 square feet floor area). 5%			
Note—(Approved extinguishers may be accepted in lieu of required number of pails.)			
163 Standpipe internal, near stairs, ample tank supply 2%			
164 Standpipe, appd. with external Siamese connections 1%			
165 Each side or rear accessible to fire department (no deduction for front or alley) .2%			
167 Bas. and/or sub-bas. with approved equipment of automatic sprinklers having approved external Siamese connection only...2%			
173 If bldg. occupied throughout exclusively offices or office and dwelling...................25%			
174 If bldg. above grade floor occupied for office or offices and dwellings.....................10%			
176 Watchman with watch-clock....2½% to 2½ cents.			
176a Special Building Signal...........5% to 5 cents.			
Without watchman and clock..2½% to 2½ cents.			
177 Roof Hydrants (with approved hose and protected) 2%			
178 Floor beams and girders, self-releasing.........1%			
136 FIRE BOAT. If risk within 800 feet of Fire Boat 5%			
Total Deductions............			

129 NET RATE OF BUILDING OCCUPIED............. . .. .

130 EXPOSURE ....

130a " Conflagration District, Like Dry Goods Dist.. . ...

131 RATE OF BUILDING Occupied and Exposed............ .. ..

131b SPRINKLERS. If according to the requirements, deduct. ....%

132 DEDUCT 15% FOR 80% CO-INSURANCE.......................

ADD FOR FAULTS OF MANAGEMENT UNTIL CORRECTED.	No.	Amount
136 Unprotected stovepipes through floors or partitions 50		
136a Unsafe Gas or other Stoves.............10 to 25		
137 Stovepipes through window, roof or wall, but with double metal chimney...... 50		
138 Through windows not protected.................1.00		
139 Entering bottom of flue vertically...............25		
140 Entering flue in attic or unused room...........25		
141 Bottom of elevator shaft used for closet or waste 50		
142 Swinging or other unsafe gas brackets or lamps unprotected 10		
142 Untidiness, rubbish, ashes, etc., especially in cellar ....10 to 25		
143a Packing material not in bins......................15		
144 Broken Plastering, windows, cracked walls, etc. ....10 to 25		
145 Empty boxes or rubbish in rear yard, alleys, window recesses, under sidewalks, grating, etc. ....10 to 25		
146 Open Lights in Show Windows.....................25		
146a Unsafe Gas Engine.....................................25		
147 Sawdust on floors, sawdust spittoons..............10		
148 Benzine, according to quantity................10 up		
149 Ash or waste cans approved, if none...............10		
149a Oily floors under machines, lack of drip-pans...10		
149b Steampipes in contact with wood....................01		
153 Elevator or other shaft communicating with roof space............. .... 10 to 25		
154a Crowded Mdse. without proper aisles opposite or too near windows, overloading, not less than ... .25		
Sign on roof to interfere with Fire Department 10		
Communications until approved........................		
Unsafe Electrical Apparatus........................25		
Unsafe Heating Apparatus..............................		
Rubber Hose for Heating..............................25		
.. ..		
....		
....		

FINAL RATE ON BUILDING..............................

N. B.—If building not within 300 feet of a hydrant on a properly fed 6-inch or larger water main increase rate 20%

Non-Fire-Proof Brick Buildings.
Schedule Cont.

Floor..........

Class..........

Charge..........

Rate of building occupied, No. 128, above.................... cts.

Deduct a sum equal to 10% of deficiencies of building (i. e. 10% of excess of item No. 127 over 20 cents) or 30 or .35) as follows:

Rate 127. ....cents, minus 20 cents (or 30 or .35), equals .. cents; 10% of which (cents) deducted from No. 128 leaves. ....

Key Rate.

This will be the KEY OR BASIS RATE FOR ALL STOCKS IN BUILDING

Add 75% of amount named for stock to be rated (No.) in second column of Occupancy Table ...

Add, if entire stock is above or below grade floor, each floor, 5 cents . ...

If distributed over two or more floors, add the charges for all and divide by the number of floors covered to get the average. For example, for third floor 10 cts., fourth 15 cts., and fifth 20 cts., total 45 cts., divided by 3 equals 15 cts. If stock extends only over the three floors—grade, basement and second floor, no charge or deduction.

Total.. . .. .

DEDUCTIONS FOR FIRE APPLIANCES, ETC., ON STOCK.

No.	%	cts.

193 Automatic fire alarm. ....10% to 10 cents.

193a Automatic burglar alarm.................1%

194 Chemical engines on wheels...............5%

195 Iron fire-escapes outside of building on accessible side with landing at each floor 2%

196 Casks of water or sand or filled pails (two filled pails to each 1,000 sq. feet of floor area)........................5%

Note—(Approved Extinguishers may be accepted in lieu of required number of pails.)

197 Standpipe, internal, near stairs with tank supply 2%

198 Standpipe, app. with external Siamese connection for use of fire department 1%

199 Each side or rear accessible to fire department (no deduction for front or alley) 3%

201 Bas. and / or sub-bas. with approved equipment of automatic sprinklers having approved external Siamese connection 3%

For Partial automatic sprinkler equipment allowance see board.

207 If building occupied above grade floor for offices 5%

208 If for office and dwelling...................10%

210 Watchman with watch-clock...2½% to 2½ cents.

210a Special Building Signal....5% to 5 cents. Without watchman and clock.................................2½% to 2½ cents.

211 Roof hydrants (with approved hose and protected) 1%

214 Merchandise in tin covered cases..........5%

215 Skids. If merchandise in bales or unopened cases or similar original and unbroken packages is kept on skids or platforms 6 inches high, deduct 2%

216 Grade floor stock; if stock exclusively on grade floor, deduct 5%; if stock extends only over one additional floor, basement or second, skidded..3%

221 FIREBOAT. If risk within 800 feet of Fire Boat 5%

Total........................ % & C.

134 RESULT.—(See note.) Rate on stock in unexposed building....

134a EXPOSURE ....

134b Conflagration District, outlying exposures, etc.........................

Total..

134c SPRINKLERS. If according to requirements, deduct....%......

135 DEDUCT 7½% FOR 80% CO-INSURANCE..............................

ADD FOR FAULTS OF MANAGEMENT, same as building.....

FINAL RATE ON STOCK..

N. B.—If building not within 300 feet of a hydrant on a 6-inch or larger water main increase rate 25%

Schedule Non-Fireproof Brick Building—Continued

127 RATE ON BUILDING UNOCCUPIED (Brought Forward)..........

Occupied by Nos..

127a Add 50% of amount in first column for most hazardous occupancy...

128 RATE ON BUILDING OCCUPIED.. ... .

DEDUCTIONS FOR FIRE APPLIANCES ETC., ON BUILDINGS.	No.	%	cts
158 Automatic fire alarm..............10% to 10 cents.			
158a " burglar alarm..... .... .1%			
159 Chemical Engine on wheels.......................5%			
160 Iron fire escapes on accessible side with landings each floor........ ....2%			
161 Casks of water or sand or filled pails on each floor (2 filled pails for each 1,000 square feet floor area). 5%			
Note—(Approved extinguishers may be accepted in lieu of required number of pails.)			
162 Standpipe internal, near stairs, ample tank supply 2%			
164 Standpipe, appd. with external Siamese connections 1%			
165 Each side or rear accessible to fire department (no deduction for front or alley) .2%			
167 Bas. and/or sub-bas. with approved equipment of automatic sprinklers having approved external Siamese connection only...2%			
173 If bldg. occupied throughout exclusively offices or office and dwelling..................25%			
174 If bldg. above grade floor occupied for office or offices and dwellings......................10%			
176 Watchman with watch-clock....2½% to 2½ cents.			
176a Special Building Signal...........5% to 5 cents.			
Without watchman and clock..2½% to 2½ cents.			
177 Roof Hydrants (with approved hose and protected) 2%			
178 Floor beams and girders, self-releasing.........1%			
136 FIRE BOAT. If risk within 800 feet of Fire Boat 5%			
Total Deductions...........			

129 NET RATE OF BUILDING OCCUPIED............. . .. .

130 EXPOSURE ....

130a " Conflagration District, Like Dry Goods Dist.. . ...

131 RATE OF BUILDING Occupied and Exposed........... .. ..

131b SPRINKLERS. If according to the requirements, deduct. ....%

132 DEDUCT 15% FOR 80% CO-INSURANCE.............................

ADD FOR FAULTS OF MANAGEMENT UNTIL CORRECTED.	No.	Amount
136 Unprotected stovepipes through floors or partitions 50		
136a Unsafe Gas or other Stoves...............10 to 25		
137 Stovepipes through window, roof or wall, but with double metal chimney...... 50		
138 Through windows not protected..................1.00		
139 Entering bottom of flue vertically................25		
140 Entering flue in attic or unused room............25		
141 Bottom of elevator shaft used for closet or waste 50		
142 Swinging or other unsafe gas brackets or lamps unprotected 10		
142 Untidiness, rubbish, ashes, etc., especially in cellar ....10 to 25		
143a Packing material not in bins.......................15		
144 Broken Plastering, windows, cracked walls, etc. ....10 to 25		
145 Empty boxes or rubbish in rear yard, alleys, window recesses, under sidewalks, grating, etc. ....10 to 25		
146 Open Lights in Show Windows....................25		
146a Unsafe Gas Engine..................................25		
147 Sawdust on floors, sawdust spittoons..............10		
148 Benzine, according to quantity.................10 up		
149 Ash or waste cans approved, if none............10		
149a Oily floors under machines, lack of drip-pans...10		
149b Steampipes in contact with wood.................01		
153 Elevator or other shaft communicating with roof space............ .... 10 to 25		
154a Crowded Mdse. without proper aisles opposite or too near windows, overloading, not less than ... .25		
Sign on roof to interfere with Fire Department 10		
Communications until approved......................		
Unsafe Electrical Apparatus.........................25		
Unsafe Heating Apparatus............................		
Rubber Hose for Heating..............................25		
.. ..		
....		
....		

FINAL RATE ON BUILDING.........................

N. B.—If building not within 300 feet of a hydrant on a properly fed 6-inch or larger water main increase rate 20%

Non-Fire-Proof Brick Buildings. Schedule Cont.

Floor..........

Class..........

Charge..........

Rate of building occupied, No. 128, above.................... cts.

Deduct a sum equal to 10% of deficiencies of building (i. e. 10% of excess of item No. 127 over 20 cents) or 30 or .35) as follows:

Rate 127. ....cents, minus 20 cents (or 30 or .35), equals .. cents; 10% of which (cents) deducted from No. 128 leaves. ....

Key Rate.

This will be the KEY OR BASIS RATE FOR ALL STOCKS IN BUILDING

Add 75% of amount named for stock to be rated (No.) in second column of Occupancy Table ...

Add, if entire stock is above or below grade floor, each floor, 5 cents ....

If distributed over two or more floors, add the charges for all and divide by the number of floors covered to get the average. For example, for third floor 10 cts., fourth 15 cts., and fifth 20 cts., total 45 cts., divided by 3 equals 15 cts. If stock extends only over the three floors—grade, basement and second floor, no charge or deduction.

Total.. .. ..

DEDUCTIONS FOR FIRE APPLIANCES, ETC., ON STOCK.

	No.	%	cts.
193 Automatic fire alarm. ....10% to 10 cents.			
193a Automatic burglar alarm......... ....1%			
194 Chemical engines on wheels...............5%			
195 Iron fire-escapes outside of building on accessible side with landing at each floor 2%			
196 Casks of water or sand or filled pails (two filled pails to each 1,000 sq. feet of floor area)....................5%			
Note—(Approved Extinguishers may be accepted in lieu of required number of pails.)			
197 Standpipe, internal, near stairs with tank supply 2%			
198 Standpipe, app. with external Siamese connection for use of fire department 1%			
199 Each side or rear accessible to fire department (no deduction for front or alley) 3%			

201 Bas. and / or sub-bas. with approved equipment of automatic sprinklers having approved external Siamese connection 3%

For Partial automatic sprinkler equipment allowance see board.

207 If building occupied above grade floor for offices 5%

208 If for office and dwelling..........,.....10%

210 Watchman with watch-clock............ ....2½% to 2½ cents.

210a Special Building Signal....5% to 5 cents. Without watchman and clock.......... ....2½% to 2½ cents.

211 Roof hydrants (with approved hose and protected) 1%

214 Merchandise in tin covered cases.........5%

215 Skids. If merchandise in bales or unopened cases or similar original and unbroken packages is kept on skids or platforms 6 inches high, deduct 2%

216 Grade floor stock; if stock exclusively on grade floor, deduct 5%; if stock extends only over one additional floor, basement or second, skidded..3%

221 FIREBOAT. If risk within 800 feet of Fire Boat 5%

Total.........................

% & C.

134 RESULT.—(See note.) Rate on stock in unexposed building....

134a EXPOSURE ....

134b Conflagration District, outlying exposures, etc......................

Total..

134c SPRINKLERS. If according to requirements, deduct....%......

135 DEDUCT 7½% FOR 80% CO-INSURANCE........................

ADD FOR FAULTS OF MANAGEMENT, same as building......

FINAL RATE ON STOCK..

N. B.—If building not within 300 feet of a hydrant on a 6-inch or larger water main increase rate 20%

For Both Of Foregoing Schedules.

EXPOSURE

Calculate the exposure as per tables, for given distance or condition for each side and enter in its column, add or subtract from charge as follows: carrying the net result by successive processes down the column to the bottom.

	Front.	Right.	Rear	Left.
Height				
Rate				
Distance				
Length of Side				

RATE OF EXPOSURE LESS THAN 1 PER CENT., pro rate charge.

BUILDINGS SEPARATED.—With openings. N. B.—(Wooden Cornice or Wooden Mansard same as openings.)

BLANK WALL OF RISK towards exposure deduct 4-5 of charge. (No deduction if wooden cornice or mansard.)

" " of Exposure towards risk, deduct 1-2.

" " TO BOTH, deduct 90 per cent.

OPENINGS NOT OPPOSITE each other, deduct 30 per cent.

" ON GRADE OR FIRST FLOOR ONLY, deduct 25 per cent.

IF BUILDINGS ADJOINING.—Charge as per tables E and F.

WALLS NOT THROUGH ROOF.—If division wall between two adjoining risks does not extend through roof, cutting off roof timbers, charge same as per tables E and F for communications above first floor with single fire door.

LENGTH OF EXPOSED SIDE OF RISK.—Less than 75 running feet, 1 per cent. less for each foot. No deduction if adjoining with communication.

" of Exposure.—Less than 75 feet, 1-2 per cent. less for each foot.

(N. B.—No deduction under these items, however, if the exposure building contains Oils or other "grease risks." Wholesale Drugs, stocks of Furniture, Agricultural Implements, Carriage or Wagon Materials or other Wood risks—hazards of intense combustibility.)

HEIGHT OF EXPOSURE.—If less than 5 stories, deduct 10 per cent. for each story less than 5. If over 5 stories, add 25 per cent. for each story over 5.

FALLING WALL HAZARD.—Add not less than 2 per cent. of the rate of the exposing risk.

GLASS FRONT OR SIDE OF RISK.—Increase charge 10 per cent if first story, 20 per cent. for second, and 10 per cent. for each additional story.

" " OF EXPOSURE.—Increase charge 20 per cent. for each glass story above first or grade floor.

STANDARD FIRE SHUTTERS OR WIRED GLASS WINDOWS.—To window openings of risk, deduct 2-5.

" " To window openings of exposure, deduct 1-3.

" " TO BOTH risk and exposure, deduct 45 per cent.

LARGE AREA OF EXPOSURE, exceeding 10,000 square feet and height exceeding intervening distance, increase charge 20 per cent. and add a further 2 per cent. for each 1,000 in excess of 10,000.

FRAME EXPOSURE, increase charge 50 per cent., but not exceeding a sum which shall make rate of risk equal to 80 per cent. of exposure.

IF BOTH RISK AND EXPOSURE RATES ARE BELOW 1 PER CENT.—Take such percentage of final result as the rate of risk bears to 1 per cent., e. g., if 65 cents, 65 per cent.; if 45 cents, 45 per cent., etc.

Total Exposure Charge for all sides.

HEIGHT OF RISK.—If under five stories high, deduct 15 per cent. of total charges for each story less than five. If over five stories high, add 15 per cent. for each story over five, not exceeding 75 per cent.

Deduct 10 per cent. from final exposure charge as working margin. Charge remainder as building exposure. Deduct from building exposure 25 per cent.; charge remainder as contents exposure.

APPENDIX 3

REPORT OF PHILADELPHIA FIRE MARSHAL

(with 5 Exhibits)

JAMES ROBINSON, January 1, 1914.
SUPERINTENDENT OF POLICE.

Dear Sir:

The total amount of fire loss during the year was $2,247,949, a decrease of $883,463, or 28%, from that of the previous twelve months.

The total number of fires was 3651, as compared to 3401 during 1912, or an increase of 7%; but it is pleasing to report that the average loss per fire during 1913 was $615, whereas each fire of the year previous averaged a loss of $908.

The number of fires of the past year averaged approximately 1 in each 100 (based on the approximate 380,000 buildings in the city), and the fire loss per capita $1.40; whereas in 1912 our per capita loss was nearly $2.00.

With our daily fire loss of $8420 in 1912 and $6160 in 1913 there can be no question but that every known modern human and mechanical safeguard should be employed against this destructive agent.

The year just ended in the office of the fire marshal has marked the rounding out of coöperative work between divisions of the office corps and the Bureaus of Fire, Police, Electrical, Building and Boiler Inspection, and also with the Tenement House and Sanitation Bureaus of the Department of Health and Charities.

In performing inspection service within buildings, inspectors will find many opportunities to correct defects which are not directly connected with their assignments. By the valued coöperation between the bureaus above mentioned all inspectors have been enabled to report conditions needing the immediate attention of the several bureaus, with the result that needed improvements are quickly made without the expenditure of undue time or effort.

As emphasized in the last report of the Philadelphia Fire Prevention Commission, there certainly can be no great progress made in abating fire waste of life and property unless corrective and preventive efforts be applied to property before fire occurs, instead of confining the city's activities to extinguishing and investigating fires after they occur.

The fire marshal's work is twofold: Fire prevention, and reduction of loss from incendiarism and other known causes. More than half of all fire waste in this city unquestionably arises from easily preventable causes. People become almost criminally careless, with the result that fire waste constantly increases and yearly causes enormous loss of created resources.

Merely bewailing existing conditions and deploring the evil will not help. Nor will sensational tactics work a solution of the difficulty. One point to be impressed is that incendiary fires occasion at present only a relatively small part of our fire loss here. It is apparent, therefore, that we must do more than deal with incendiarism. We must reduce fire losses, if they are to be reduced, by cutting down the hazard.

By the activity of the Philadelphia Fire Prevention Commission, appointed after a preliminary study of local conditions and based on the commission's first report under date of January 1, 1913, inspection of properties by the active fire-fighting force was finally inaugurated February 14, 1913. Since that date 75,000 buildings have been inspected and reinspected and corrections and improvements effected, and a persistent effort made to awaken public interest to the dangers that are thoughtlessly permitted to exist and known to every fireman as dangerous. The active firemen have been given opportunity and required to learn the structural and physical conditions and nature of contents of the properties adjacent to their fire station, thus enabling them to enter all such buildings with more speed and safety when necessary, in the haze of smoke and darkness, because of the knowledge gained during inspection as to the location and condition of stairs, elevators, traps, entrances, etc.

The organization, functions, operation and results for the year are detailed as follows:

ORGANIZATION

The office of fire marshal, caring for many different classes of work, has several distinct divisions in its organization, as follows:

1. Fire marshal.
2. Chief assistant fire marshal and three deputies.
3. A record clerk and stenographer.
4. Five selected inspectors from the uniform firemen, in charge of a captain and a lieutenant, Bureau of Fire, who serve as street superintendents and record clerks. This group is the administrative force in charge of fire prevention work, which includes 78 active firemen—one from each fire company working within a district nearest his company station.
5. Seven selected theater inspectors from the uniformed firemen in charge of a captain, Bureau of Fire, serving as a patrol.
6. Ten fire-escape inspectors, one of whom acts as office supervisor.

FUNCTIONS

1. To investigate and if possible determine the causes of all fires and prosecute all suspects of arson in any of its various forms.
2. To cause an inspection of properties throughout the city for the purpose of having removed or remedied the combination of conditions that invite fire and thereby endanger persons or property.
3. To inspect all properties used, and interrogate all persons responsible therein, for the manufacture, storing and using of high explosives, dangerous chemicals and high combustibles; and to certify before issuance of licenses therefor that all proper safeguards to the public safety have been provided.
4. To regularly and frequently inspect all theaters, moving-picture parlors and other places of public assembly to insure proper observance of the laws and regulations safeguarding the public therein; and to certify to the proper authorities that all acts, ordinances and regulations are complied with before issuance of licenses for these places.

5. To examine all applicants to operate moving-picture machines and to issue licenses to those who successfully pass, and also to prevent other than licensed operators serving in this capacity.

6. To provide sufficiently safe means of egress from all other than private residences by the enforcement of the fire-escape law, including also such minor appliances as ropes and chains, alarm gongs, exit signs and lights—all supplemented by the organization of fire drills in appropriate properties, especially where females are employed.

7. To investigate all complaints that are based on conditions that would endanger public safety in the event of fire, and having same corrected where they are well founded; and in particular to ordering the removal of dangerous conditions resulting from fire.

OPERATIONS AND RESULTS

The fact that all prosecutions on the charge of arson, or fires designedly set, must largely be made on circumstantial evidence, emphasizes the saying that "It is harder to convict of arson than for murder." It is therefore imperative to carefully filter out fires of this class from all others and relentlessly pursue their creators to conviction.

The 3651 fires during the year were investigated and their origin attributed to the following causes:

CAUSES OF FIRES

Alcohol	2	Incendiary	4
Boilers	2	Incendiary suspected	18
Boiling lard (oils)	83	Kilns	2
Candles	108	Lightning	40
Chimneys	127	Matches	807
Defective flues	109	Open grates	8
Drying rooms	7	Ovens	12
Electricity	158	Ranges	60
Explosion of chemicals	8	Rekindling	18
Explosion of gas	18	Rubbish	56
Fire-pot tinkers	10	Smoking	164
Fireworks	40	Sparks from locomotive	348
Friction	62	Sparks from smokestacks	336
Furnaces	1	Spontaneous	91
Gas irons	3	Steam pipes	10
Gas jets	126	Stoves	130
Gas stoves	56	Sulphur	5
Heaters	45	Sundry	5
Hot ashes	55	Unknown	288

PETROLEUM FIRES

Coal-oil lamps	55	Explosions of gasoline	9
Coal-oil Stoves	34		——
Gasoline lamps and stoves	16	Total	3651
Gasoline motors	115		

Revenge, pyromania, to secure insurance, and lax public sentiment practically cover the category of arson causes. Following is a summary of the work of this office in pursuit of persons charged with incendiarism:

Jacob Wolf, 129 No. 58th street, arrested March 11, 1913, for fire in store. Held for court without bail March 12, 1913. Convicted and sentenced to six months in county prison.

Albert A. F. Fischer, 3518 Haverford avenue, 21 years old, arrested March 14, 1913, for setting fire to bakery at above address. Held without bail. Convicted and committed to Huntington Reformatory.

Antonio Ricca, corner 11th and Carpenter streets, drug store; arrested March 23, 1913, and tried; jury disagreed; new trial ordered.

Lizzie Robinson, 409 Gaskill street, 25 years old; arrested March 26, 1913, for setting fire to clothing, pouring oil over same, at above address. Convicted and sentenced to five years in penitentiary.

Abram I. Schwinger, 6020 Market street, 26 years old; arrested May 26, 1913; convicted of arson and sentenced to six months in county prison.

An index of the names of parties financially or morally interested in all fires has been inaugurated for the obvious purpose of identifying a person whose property is frequently destroyed.

PROPERTY INSPECTION—FIRE PREVENTION

The inevitable result of property inspection will be a large reduction in the city's loss from fire in the near future. This is not a prophecy from an over-confident fire marshal but a statement based on the experience of other cities and States, as witness the following:

Cincinnati began the work of building inspection with uniformed firemen in May, 1912. About four-fifths of the 80,000 buildings were inspected, resulting in a complete elimination of fires originating in the cellars, basements and attics in the inspected buildings, and, so far as they are able to determine, resulting in a reduction of fire loss of about 40%, as compared with the 10-year average, notwithstanding the occurrence of several large fires since the system was put in operation. Though they had 101 more fires last year than in 1911, the working hours of the firemen were 1300 less, showing that fires spread less rapidly and were more easily extinguished, owing to more cleanly conditions.

Canton had a per capita loss of $4.00 per annum, but by its system of inspection by uniformed firemen has reduced its per capita loss to 40 cents per annum. Fire Chief Robert C. Mesnar ascribes their success wholly to the building inspection plan, and says he would rather make the city safe from fire by inspection than show the utmost skill in extinguishing fires. Canton has a population of 51,000 and about 70 firemen distributed in 9 houses. One man from each house is on inspection work every day in the year, except Sundays and holidays.

Cleveland, up to last May, depended wholly on the fire marshal system, with six fire marshals distributed in as many districts and permanently assigned to inspection work. The system was changed at that time and regular inspection work is now performed by uniformed firemen specially detailed for that duty, one from each company. Both Chief Wallace, who was an ardent advocate of the fire marshal system, and Assistant Chief Whyler, who preferred the present system, agree that wonders have been accomplished in bettering the fire conditions of the city.

Youngstown had a higher loss ratio than Canton, with a per capita well above $4.00. Now its fire losses are reduced to less than 60 cents per capita. Youngstown has about ten fire houses, one man from each house assigned to inspection duty each working day. Besides this, the chief and his assistant do much individual inspection work, and members of the department on their days off often volunteer for additional inspection work.

Toledo probably was the first city in the country to inaugurate this kind of inspection work, and the result has been an almost unbroken decrease of fire losses from year to year, and reduction in the working hours of the firemen, notwithstanding steady increase in the city's population, the congested-value district and general distribution of property.

These cover the principal cities of Ohio, where the system has been inaugurated along business lines and carried forward with energy and reasonable intelligence.

The New York City department has been successful in cutting down the number of fires by more than 20 per cent., the fire losses from more than twelve millions to below eight millions, and incendiary fires by more than half. The city now employs special inspectors, but the new administration will assign firemen for this duty.

Similar activity in the city of Rochester has cut the fire waste in half during the past two years.

In Newark, N. J., notwithstanding the growth in population, in volume of business and in the value at risk, fire losses have been cut down by systematic work and the working hours of the firemen reduced.

In Salina, Kansas, the per capita fire loss was reduced in three years from over $1.60 to less than 40 cents.

During the past few years serious consideration has been given throughout the country to fire-waste control. The Philadelphia Fire Prevention Commission on February 14, 1913, starting with six uniformed firemen, has been since supplemented by one man from each fire company.

The city has been divided into sections and each inspection area cared for and centered about the company house of which the inspector is a member.

The radiation of inspection from a fire house by a company member, acting as an inspector, results in securing a knowledge of buildings where his company only would be sent in the event of a local alarm or be the first company to arrive if called by a box alarm. The education of at least three company members as inspectors, and their use alternately in this capacity, insures the presence of one of them with the company when it responds to an alarm.

Building inspections by firemen not only constitute the most effective means of educating the firemen to an appreciation and knowledge of fire hazards but also of conditions in the buildings within which they may be called on to fight fire, thus making a fire department efficient to the highest degree. All this is accomplished without additional employees or expense to the city, with admitted benefit to life and property and to the firemen themselves, and with ultimate reduction of fires and the danger and loss attending them.

Exhibit No. 4, entitled "Instructions for Fire Prevention Inspectors," clearly sets forth that the present attack on fire loss is directed against lack of cleanly and orderly occupancy of buildings, which accounts for about half of all fire waste.

The following rules were formulated by the Philadelphia Fire Prevention Commission in as close coöperation as proved possible with all authorized fire insurance underwriters' organization and individuals locally active:

Issued by the Fire Marshal's Office, January 1, 1914

It is the Fire-prevention Inspector's duty to see that:

Buildings comply in all respects with the ordinance requirements.

All fire apparatus is kept in good condition and ready for immediate use.

Lighting systems are properly maintained.

All exits open outward, are unobstructed and unlocked during the time building is open to employees or the public.

All aisles, passageways and corridors are of proper width and kept clear. All windows, doors, stairways and elevator shafts should be kept clear from goods and materials of every kind.

Stairs and fire escapes are unobstructed.

Stairways are equipped with hand rails where required by ordinance.

All fire escapes extend from roof to ground and are kept in good repair and painted.

All volatile oils (benzine, gasoline, cleaning fluids, etc.) are kept in approved manner as required by ordinance.

All smoke pipes have proper clearance to any combustible material.

Acids in excess of one day's supply are properly stored.

Ashes are not kept in combustible receptacles or dumped in contact with or in close proximity to any combustible material.

All ovens, furnaces, and heating or power devices are installed in accordance with the ordinance requirements.

Boiler arches and breechings are protected and sufficient clearance is maintained to combustible material.

No rubbish is burned on the premises, alley or street unless approved rubbish burners are used.

Calcium carbide is stored in airtight and waterproof metal containers and in accordance with ordinance requirements.

All broken windows, broken plastering, holes in floors are repaired without delay.

Charcoal is kept in a cool, dry place.

Powdered charcoal is stored in metal bins or cans in a cool, dry place.

Waste paper and rubbish are kept in metal cans and removed from premises each night.

Paper and rags for baling are well sorted so as to insure exclusion of matches, oily and greasy paper, rags and waste.

Metal cuttings from oil-using machine are kept in standard cans and removed daily from the building.

Packing material is kept in bins of metal or metal-lined wood having self-closing or automatic covers.

All stock is kept at least 18 inches below all ceilings, and if building is equipped with automatic sprinklers, 18 inches below sprinkler piping.

No wooden lockers are used for oily clothes, rags or waste.

Soft coal is stored away from brickwork of boilers and furnaces and is kept only in incombustible rooms.

Metal drip cups are installed under all shaft bearings.

All gas stoves, ranges, plates and other types of heaters are connected with the source of gas supply by metal piping.

No swinging or folding gas brackets shall be placed against any stud, partition or woodwork.

No lava tips are used for gas jets; only screw-type metallic tips are permissible. Permit no paper, cotton or other decorations on electric light globes, wires or fixtures. The use of candles in decorating is also dangerous. Keep inflammable materials and decorations away from stoves and stove pipes and steam pipes.

All gas plates and glue pots are set on non-combustible base.

No open lights of any kind are used in rooms where woodworking, painting, japanning, finishing or upholstering is done, or where highly inflammable materials, oils or other volatiles are handled.

All paint mills and printing presses are set on a metal-clad or an incombustible floor and the surroundings are kept neat and clean.

All pressing irons and heaters have proper protection under same.

Rubbish shall not be allowed to accumulate in any part of any building, nor outside of and adjacent to any building, paying special care to elevator, stair and air shafts, under benches, in closets, in dark and out-of-the-way places, around electric machinery, steam pipes and places where oils are used or stored. No sawdust or other combustible absorbents are used in cuspidors or for soaking up oils.

Smoking is prohibited in all shops, theaters, and in all places where volatiles are handled or hazardous processes exist.

All steam pipes are kept free from inflammable material and are surrounded by metal collars where passing through combustible floors or partitions.

No gasoline stoves are permitted in any building.

Never hang electric drop cords over nails or hooks or suspend them by wires or wrap them around steam pipes.

Discourage use or sale of "parlor" or "snaphead" match; keep matches in a metal box, away from mice and rats.

Before starting the heavy winter fires make sure that the heater plant and chimney are in good repair and clean. Have metal protection under and at the back of the stove. Run stove pipes direct to a brick chimney, never through ceilings or partitions. The

> chimney should be built from the foundation up and never rest on brackets.
>
> All windows, doors, stairways and elevator shafts should be kept clear from goods and materials of every kind.
>
> Every inspector should improve his mind and thereby the caliber of his work by studiously familiarizing himself with acts, ordinances and regulations in the various municipal departments that control the various features of fire prevention.
>
> On reinspection our representative should actually see and examine in detail the method of each improvement, and where orders have not been complied with the inspector should endeavor to see the responsible party, calling attention to the violation and the possible disastrous results that would follow. He should point out that loss of life resulting from inattention to the order represents criminal negligence and obtain, if possible, a set date by which the order will be complied with; where this satisfaction cannot be obtained the special attention of the office should be directed to the specific cases.

Comparison of these precautions with the causes of the starting and spreading of the 3651 fires in 1913 should convert the most incredulous to the fire-prevention idea. The law of average conditions effecting average results is likewise convincing in the following tabulation of corrections recorded in 29,068 buildings of the 45,104 originally inspected, to which our inspectors returned from February 14 to the end of the year 1913. Although the list records 108,460 accomplished improvements, it does not include those ordered in the 16,036 buildings originally inspected to which our inspectors have not returned, wherein will certainly be found half as many additional corrections.

NEW SAFETY FEATURES INSTALLED

Fire Pails	41,112	Fire ropes	2
Sand Pails	809	Elevator doors	18
Metal cans	6,561	Metal-lined boxes	541
No Smoking signs	16,712	Water barrels	91
Exit signs	343	Fire doors	3
Safety cans	135	Hose	13
Fire extinguishers	787	Nozzles	7
Wire waste baskets	12	Steps to fire escapes	2
Metal stands and flexible tubing on gas irons	54	Gasoline tank	1
		Fire drills	4
Ladders to roof	6	Flexible hose	120
Balers for paper	2	Alarm system installed	3
New lids for metal cans	73	Alarm system signs posted	10

PROTECTION APPLIED

Steam pipes protected and cleared	27	Radiators protected and cleared	69
Ironing boards, tables and floors protected	93	Motors protected	34
Hazardous coal stoves	983	Fusible links placed on hatch doors	98
Gas stoves	1,156	Lacquer room metal-lined	1
Oil stoves	18	Excelsior and paper bins metal-lined	167
Swinging gas jets made stationary, wire guards	5,670	Dumbwaiters metal-lined	2

Elevator doors metal-lined underneath	92	Metal protection under irons	68
Boxes for rubbish, etc., metal-lined	208	Terra-cotta thimbles	52
Hose reracked and repaired	179	Protection over and around boilers	18
Oil lamps	8	Rings around stove pipes	22

REPAIRS MADE

Fire escapes	271	Basement made accessible (additional stairway)	21
Electrical	8	Walk lights (instances)	3
Chimneys	416	Buildings	228
Defective flues and holes	2,196	Automatic-sprinkler alarm	1
Siamese steamer connections	14		

REMOVALS

Rubbish piles	7,056	Oils from building to yard	57
Exits to fire towers cleared, doors unlocked and a 3-ft. aisle space maintained	1,783	Windows cleared	246
Stoves	32	Stock from radiators	69
		Elevator pits cleaned	96

RECHARGING

Chemical extinguishers	1,195
Fire pails refilled	18,395
Total improvements	108,467

The reasonable structural correction of all properties particularly in the congested center will be actively undertaken in the near future so that great loss of life and property may be eliminated.

HIGH EXPLOSIVES

For convenience the ordinance relative to High Explosives, April 2, 1901, is divided as follows:

A

An ordinance to regulate the manufacturing, having, keeping, selling, using, transporting and carrying of high explosives.

B

An ordinance to regulate the manufacture, storage and keeping for sale of certain chemicals and combustibles.

C

An ordinance to regulate the having, using, storing and keeping of benzine, naphtha, gasoline, benzole and other similar petroleum or coal tar products or any articles containing the same.

D

An ordinance to regulate the manufacture, transportation, sale, storage and use of acetylene and calcium carbide.

As required, inspection of 352 applications under class A were made which resulted in the approval of 345 and the refusal of 7.

For class B, 72 applications were made, resulting in 65 approvals and 7 rejections.

Under class C, 779 applications were investigated, 770 approved and 9 rejected.

In class D, 11 applications were received, 9 approved and 2 rejected.

In each instance it was necessary to visit the premises and make a thorough investigation before passing upon the safety surrounding the recognized dangerous materials in these classes.

VOLATILE OILS AND PETROLEUM PRODUCTS

At present there is no urgent need of local legislation on the subject of petroleum products.

Until June 20, 1913, an act of Assembly of 1864 governed local control of petroleum and its products. This was so worded that it not only failed to meet present-day needs of the ever-increasing use of this commodity but likewise prevented local legislation on the subject. By the activity of the Philadelphia Fire Prevention Commission a bill repealing this antiquated control was introduced and passed by the Legislature, thereby clearing the way for City Councils to regulate by ordinance the dangerous and increasing use by providing all known safeguards.

THEATER AND PLAYHOUSE FIRE CONTROL

As a result of an investigation this Spring of the irregular and inadequate inspection of theaters a system was inaugurated that will increase the efficiency and furnish equal service to all.

There are in Philadelphia at present 38 theaters and 237 moving-picture parlors, besides numerous dance halls, boxing clubs and other places of public assembly, which are inspected by the fire marshal, who certifies to the issuance of the licenses. Twelve million patrons visit the theaters each year and 350 million visit the moving-picture theaters and lesser vaudeville shows each year, subjecting some person on each of these occasions to the fire hazard of the property visited once per annum. During the year past these places were subjected to a total of 6000 inspections by the fire marshal's corps, independent of the work of the theater patrol.

The theater patrol was inaugurated October 6, 1913, and consists of six uniformed firemen under command of a captain. The direct purpose was to create uniform, efficient and properly supervised playhouse inspections by the Bureau of Fire in coöperation with the fire marshal, upon whom power is conferred by law to safeguard life and property in these places.

Among the new methods adopted for safeguarding theater patrons from fire was the organization of fire drills among all the employees of these houses, to assure the use of the most direct of the numerous exits, and empty the building quickly in the event of fire.

They are instructed how to promptly notify the city fire department in the event of fire and are trained in the proper use of the private fire apparatus in the building while awaiting the arrival of fire engines. These drills are given weekly by the Bureau of Fire representatives, and almost daily by the chief and his assistant of the house patrol, who are sworn in as special officers.

Inspections by the theater patrol during the performance are as follows:

INSPECTION OF THEATERS

Academy of Music	69	Standard	98
Little Theater	70	Alhambra	125
Broadway	123	Forrest	87
Garrick	89	Palace	126
Colonial	128	Lyric	107
Adelphi	108	Dumont's	166
Trocadero	202	Bijou	196
Arch	201	Casino	171
Gayety	199	Keith's	184
Walnut	137	William Penn	156
Victoria	174	Metropolitan	134
Fairmount	145	Nixon	141
Empire	120	Dixie	118
Grand Opera	125	Nixon Colonial	21
Orpheum	123	Frankford	29
Great Northern	129	People's	64
Hart's	125	American	121
Keystone	123	Allegheny	120
Girard	123		
South Broad	92	Total	4769

These 4769 inspections have impressed every playhouse employee with the importance of precaution against and proper action in the emergency of fire. The installation of the following appliances that heretofore were either missing or in poor condition is also a result of continuous inspection:

APPLIANCES INSTALLED

Fire extinguishers	27	Water casks	16
Hooks	24	Hose	18
Axes	52	Reels (hose)	7
Drills installed	39	Pockets for axes	9
Placards framed	107	Metal cans	35
No Smoking signs	300	Sand pails and scoops	43
Pails	107	Knives	8
Exit signs and red lights	2	Nozzle	1

REPAIRS MADE

Siamese steamer connections	4	Flues	1
Tables lined	2	Gas stoves protected	2
Doors repaired and protected	18	Curtain repaired	1
Vent skylight operated	30	Gas jets protected	24
Hose repaired and reracked	8	Bins metal-lined	1
Building	4	Ropes painted red	10
Electrical	3	Pails marked	10
Furnace protected	1	Fire escapes	3
Exits and obstructions	9	Switchboard protected	3

RECHARGING AND REMOVALS

Extinguishers	57	Gas jets removed	9
Stoves removed	5		
Pails refilled	255	Total improvements	1255

"NO SMOKING" AND "NO SNAP MATCHES" SIGNS

These signs are in course of preparation. They will require that, in occupancies deemed dangerous, such practices be discontinued, or the premises be so modified or reconstructed that the continuance of these practices shall create no undue fire danger.

NO SMOKING!

RAGS AND WASTE

MUST BE KEPT IN PROPER RECEPTACLES

By order of

Geo. D. Porter,

DIRECTOR, DEPARTMENT OF PUBLIC SAFETY

Posted by Fire Prevention Commission

DO NOT REMOVE

MOVING-PICTURE EXHIBITIONS

Of the 428 applications for licenses to operate moving-picture machines, 222 qualified, which, with the 860 previously granted, makes a total of 1012 operators now employed in the various places of amusement.

The chief of the Electrical Bureau and the fire marshal, composing the board of examiners, recognized that successful written examinations might result from book knowledge only, and are now considering a more practical examination than that in use by having a room fitted up with apparatus to test the applicant's practical knowledge.

The following rules were promulgated November 1, 1913, for safety to patrons of moving-picture parlors:

> The operator holding a license from the Department of Public Safety is held responsible for the condition of this booth, its equipment and the enforcement of these regulations:
>
> 1. This booth must be fireproof. One fire extinguisher and one pail of sand must be kept inside the booth.
> 2. The entrance door to booth must open outwardly, arranged with automatic self-closing fire door by means of metal rope and weight attachment, or equally satisfactory device. Door must be closed when machine is in operation.
> 3. Lookout and lens openings to be protected by gravity doors of fireproof construction overlapping all sides of openings at least 1 inch, and to be held open by fine cords which are easily combustible, and approved 165, or less, degree fusible links located inside the booth. These are the only openings permitted on the sides exposed to the auditorium.
> 4. Booth must be provided with forced draft vent by means of an electrically-driven exhaust fan, to be kept in operation throughout period of audience in the house.
> 5. Machine must be kept in first-class condition, equipped with fireproof magazines for top reel and tension take-up device with fireproof magazine for bottom reel; also automatic shutter and shields which adequately protect and cover the films between the magazines.
> 6. Never permit the film to run on the floor. If the take-up fails to work, stop the machine and fix it.
> 7. Never rewind one film while showing another. Never read while showing a picture or rewinding a reel.
> 8. Look over your films before showing them in public. If the sprocket holes are torn, mend the film; if the film is in bad condition don't use it.
> 9. Keep all extra films in metal box at all times (at least two feet away from machine).
> 10. Smoking or carrying of matches is positively prohibited in this booth, either during a performance or at any other time.
> 11. Never permit boys to operate the machine nor to rewind any films, or to visit the booth.
> 12. Give explicit instructions to the assistant operator so that there will be no misunderstanding. No operator can excuse himself or blame the assistant if an accident results from a neglect of these regulations.

13. Display for at least 60 seconds before each show, the slide directing attention to ample exits and use of one of the nearest to seat occupied in emergency.

14. In case of fire do your level best to prevent a panic.

Finally, your reputation and your license dictate close observation of the above essential precautions, as does also the fact that a penalty of $100 for violation. (Ordinance of Councils relating to moving-picture places, Feb. 20, 1908.)

Approved 11/1, 13.
Geo. D. Porter
Director Dept. Public Safety.

J. S. Mallory
Acting Fire Marshal

The licenses received for moving-picture parlors and the operators of moving-picture machines were as follows:

237 licenses granted for moving-picture parlors at $100	$23,700
222 licenses granted for moving-picture operators at $5	1,110
Total	$24,810

which is an increase of $6590 over the receipts in 1912.

The general order, effective January 1, 1913, quoted below, exemplifies the valued coöperation extended the fire marshal by the Bureau of Police in controlling safety of patrons in places of public assembly.

General Order No. 43 Philadelphia, December 28, 1912

DUTIES OF STREET SERGEANTS

On and after January 1, 1913, it shall be a part of the duty of every street sergeant to make a thorough and careful inspection, at least twice on each tour of duty, of all theaters, moving-picture shows and other places of like public amusements.

He will see that the laws, ordinances and police regulations concerning these places are strictly enforced, and he will report to the lieutenant at the close of his tour of duty the exact conditions existing.

These reports of inspection will be forwarded to this office the following morning.

By order of
James Robinson
Superintendent

This activity resulted in approximately 210,000 inspections during the year by the street sergeants who, with intelligent consideration of the lawful control that should be exercised, greatly aided the enforcement of necessary safeguards for the thousands who daily visit these places.

FIRE ESCAPES

The grave importance of providing sufficient means of safe egress from property in the event of fires received quite an impetus in the passage of an act during the last Legislature, which will add greatly to the value of the almost universally used outside iron fire escape.

The law, after requiring floor level door openings to the escape in lieu of the older practice of climbing through a window, further stipulates that all windows opening upon, over and under the escape are to be protected with wireglass in metal frames. This latter feature will prevent the repetition of a catastrophe such as happened at the Binghamton fire, when several girls lost their lives after reaching the fire escape because of the flames coming up from below.

Properties inspected for the first time	14,301
Properties reinspected	1,205
Fire escapes ordered erected	758
Fire escapes erected and approved	246
Cases referred to the city solicitor for prosecution for failure to erect escapes	215
Buildings where steps were erected for convenience through high windows to fire escapes	93
Buildings from the fire escapes of which obstructions were removed	132
Buildings in which notices directing to fire escapes were placed	673
Buildings in which rope and chain escapes were placed	517
Buildings in which red lights directing to fire escapes were placed	611
Buildings in which fire alarm gongs were placed	598
Buildings in which additional lights were placed in halls, stairs and passageways	276
Buildings cleared of dangerous rubbish	127
Buildings in which minor repairs dangerous to occupancy were made	73

AUTOMATIC SPRINKLER SYSTEM AND FIRE PROTECTION

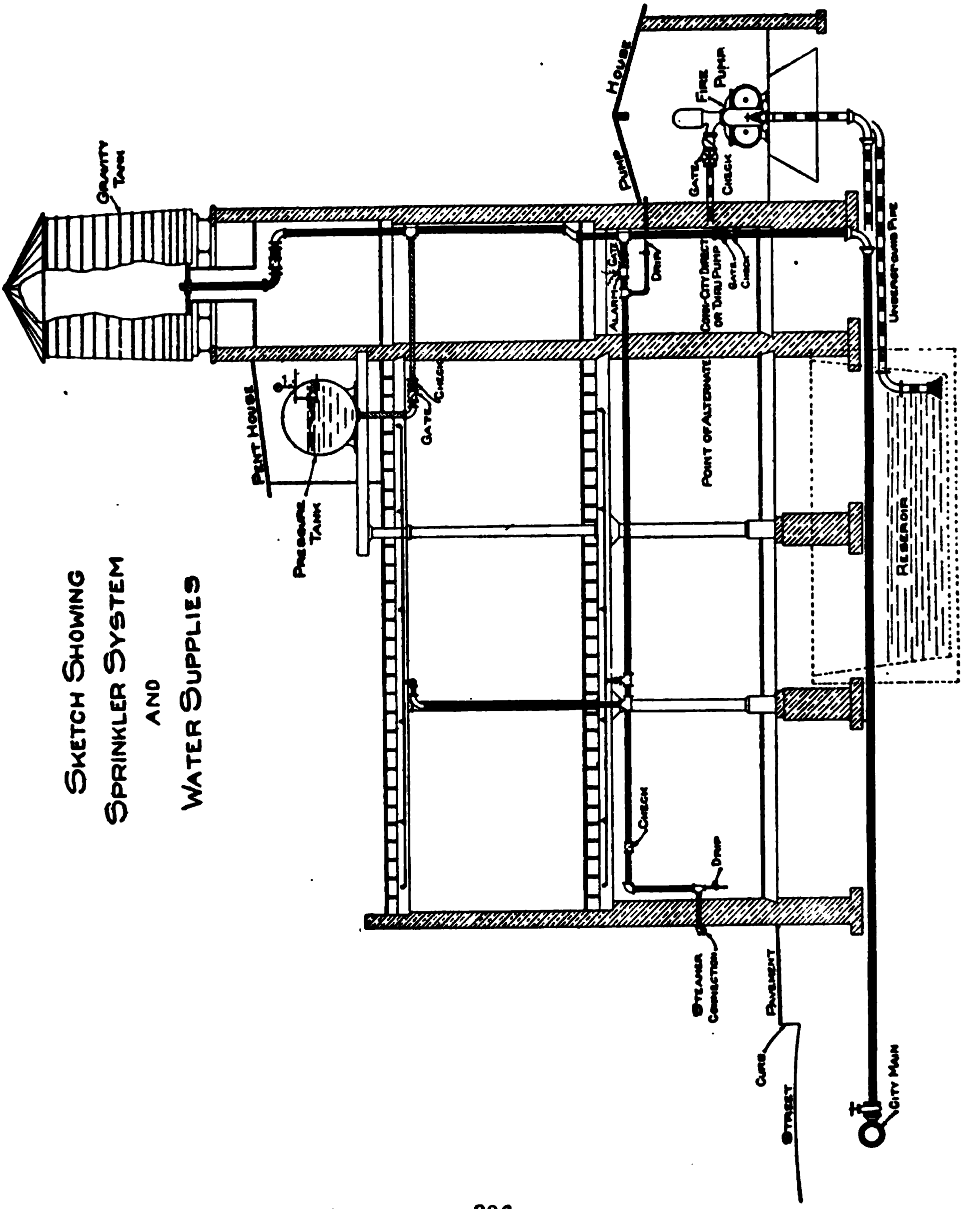
The demonstrated value of the scientifically designed and constructed automatic sprinkler system, in discharging water under high pressure through pipes to the point and at the moment of fire with no undue waste of water or unnecessary damage to building or contents, is increased and made more certain by the use of a fire engine pumping through the fire department connection to such system prominently located at an accessible point outside of the building.

This, coupled with the further facts that approximately 750 automatic sprinkler systems now protect approximately 20 per cent. of value in Philadelphia against fire, and that although such steamer connections had been installed for more than thirty years in Philadelphia, the fire department had failed in a single instance to use this ready, safe and effective means of fire fighting commonly employed in other cities, determined the director of the Department of Public Safety, upon the careful investigation and advice of the Philadelphia Fire Prevention Commission, to issue an order as follows, effective April 14, 1913:

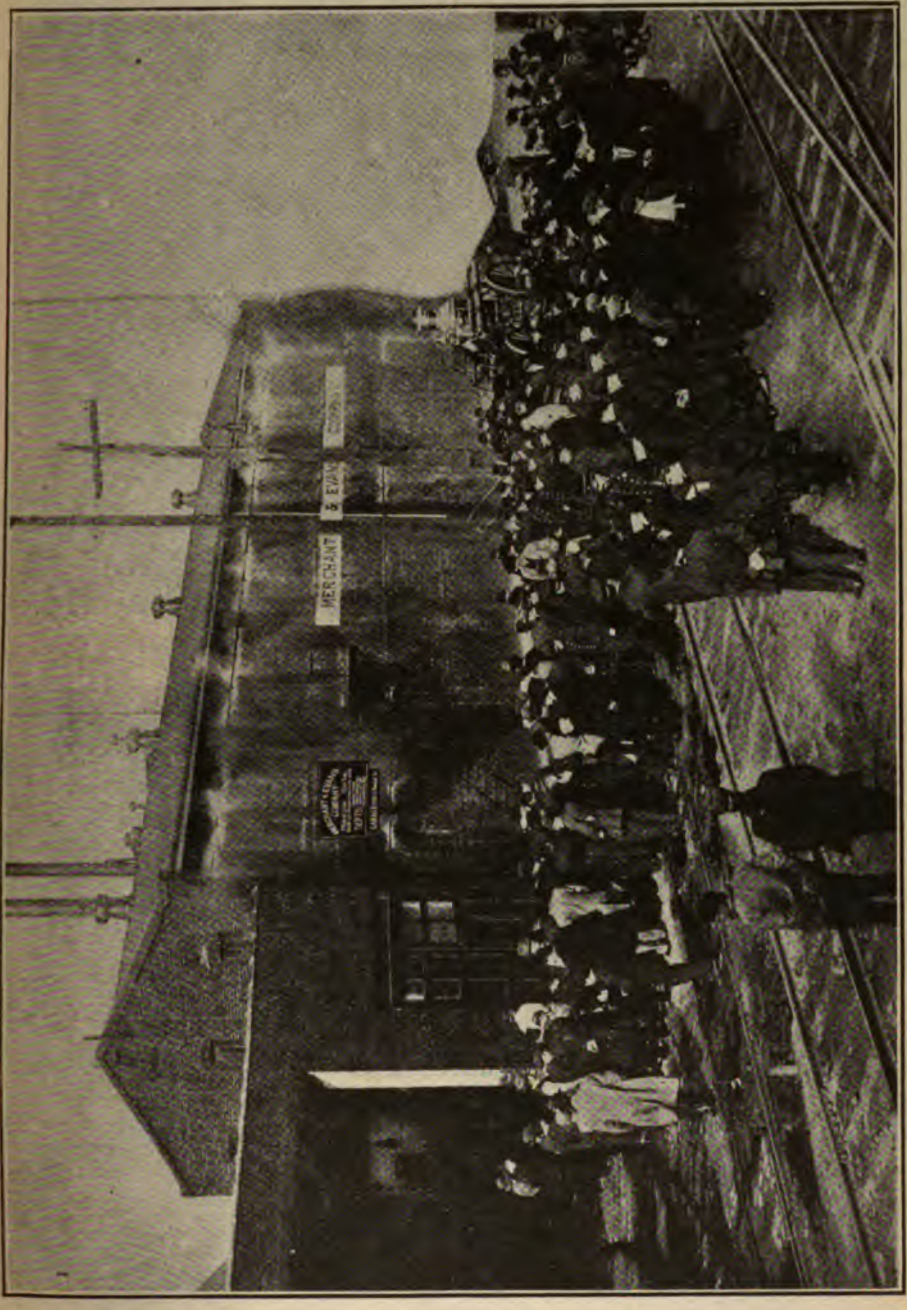
> Immediately upon the arrival of the first steamer the first line of hose shall be run into the building in accordance with the usual practice, and at the same time the second line of hose shall be connected to the sprinkler connection and a pressure of 100 pounds immediately placed on the sprinkler system—this pressure to be increased to 140 pounds if the commanding officer deems additional pressure advisable.

1—The standard outside sprinkler connection is what is called a siamese or Jones twin coupling, snap connection. Water passes through this connection past the automatic check valve into the system as an adjunct supply to any other water supplies on the system.

2—Assignments have been made of inspectors from each fire-house to go through each building listed as equipped with automatic sprinklers, so that each fire house will know the controlling valves,

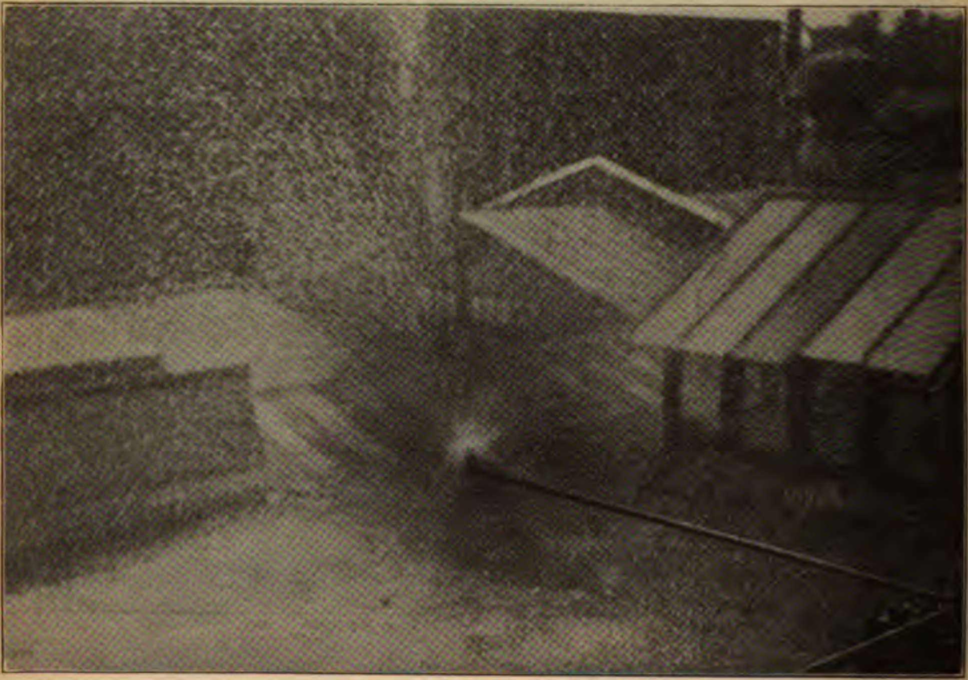


SKETCH SHOWING SPRINKLER SYSTEM AND WATER SUPPLIES

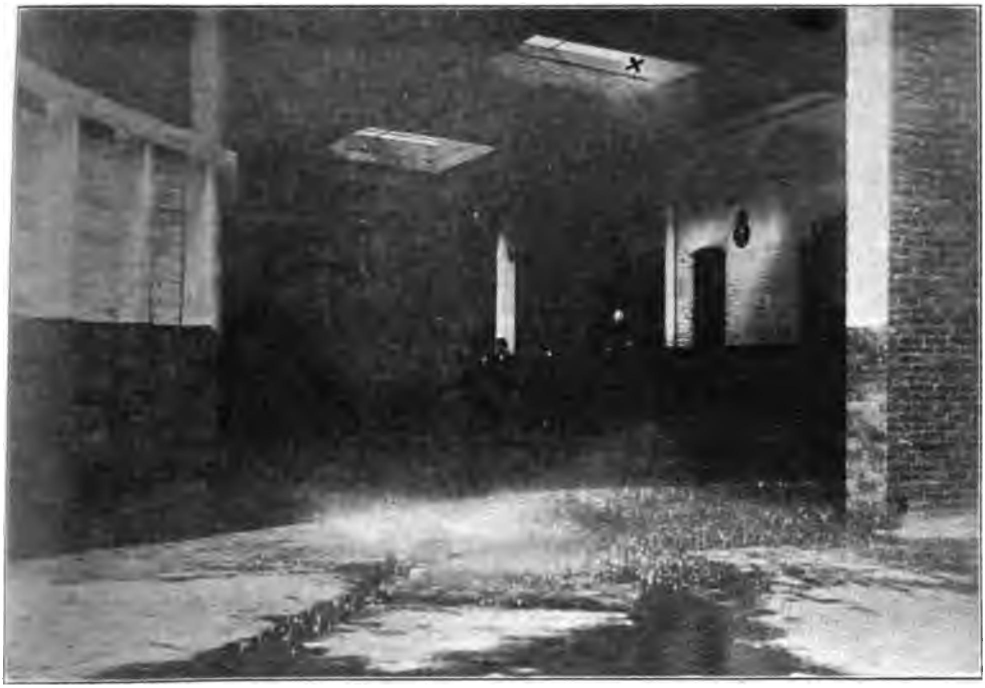


Illustrating Tank Water Pressure on Open Outside (Curtain) Sprinkler

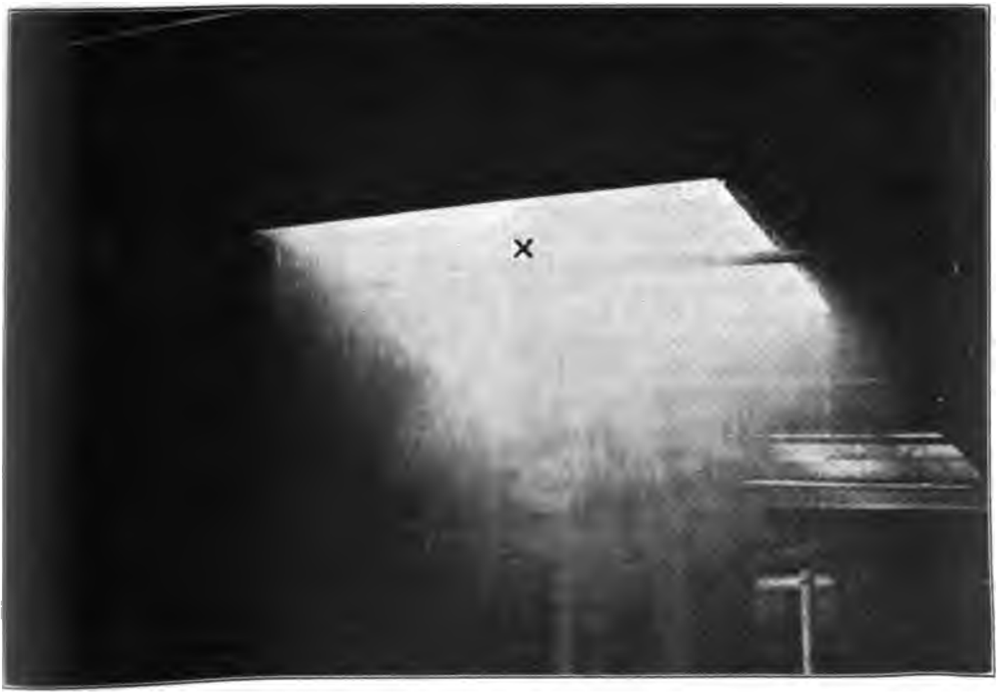
ILLUSTRATING FIRE ENGINE PRESSURE ON OPEN SPRINKLERS



ILLUSTRATING USE OF STANDARD SPRINKLER TO PROTECT ROOF



ILLUSTRATING TANK PRESSURE ON STANDARD SPRINKLER IN MILL



ILLUSTRATING FIRE ENGINE PRESSURE ON SAME SPRINKLER (X) the main pipe lines and branch lines, and also the location of fire department connections.

3—When there is more than one connection on a building the commanding officer shall make sure that the connection is made to the automatic sprinkler. It is the duty of the officer in command, in case of fire, to maintain pressure on the sprinkler system, where such exists in any building on fire, until the fire has been extinguished; and thereupon to shut off the water supply from the line on which sprinkler is open by closing the controlling valve, preferably a branch; but, if this cannot be done, then the main valve.

4—A member of the fire department is to remain at any building equipped with such water supplies until the system is again in operative condition.

5—It is the duty of the entire fire-fighting force to familiarize themselves with the primary principles of automatic sprinkler protection so as to avail themselves of these instructions in a completely intelligent manner. Such information is freely obtainable at the Fire Prevention Commission Headquarters, Room 388, City Hall.

6—It is not the intention of the department at this time to apply the above instructions to standpipe systems, due to their lack of uniformity and maintenance conditions for such adjunct use. It is the purpose of the department, in time, to use its influence to have such standpipe systems brought up to the necessary point of uniformity and maintenance conditions as to warrant their adjunct use.

To enable the uniformed fire-fighting force to understand this situation by actual demonstration, the factory of the Merchant & Evans Company, by the courtesy of its president, the chairman of the Philadelphia Fire Prevention Commission, was deliberately fired on April 5, 1913, in the presence of as many of the officers and men of the Bureau of Fire as could be spared, a fire department engine was attached and the actual use of a sprinkler system in action under working conditions was shown.

To further distribute information on the subject, twelve volunteer civilians, whose daily effort is directly applied to sprinkler protection, each visited the various houses with a typical illustrative plan of a sprinkler system (see copy attached) and explained the rudimentary facts about sprinkler connections and their use.

Added to this a letter was sent to each owner of a sprinkler system throughout the city requesting a plan or sketch showing the location of the sprinkler connection and the main controlling valve. These plans were sent to the company house nearest all such sprinkler risks with an order from the chief engineer that the officers of the company visit the risk and familiarize themselves with the essential features of the equipment, so that in an emergency they might intelligently handle these in the spirit of the order and in the absence of any one connected with the risk.

A book was prepared showing the risks provided with steamer connections within the first alarm district of each company and furnished the officers for their information.

The results of this activity have been that one large class of sprinkler risks (mutual) which, owing to the non-use of steamer connections did not provide such connections, immediately made known to their subscribers the desirability and value of it; and in the majority of instances these outside connections have since been installed.

J. S. Mallory
Acting Fire Marshal

EXHIBIT 1 (Philadelphia Fire Marshal Law)

AN ACT

Creating the office of Fire Marshal, to be attached to the Department of Public Safety in cities of the first class; prescribing his duties and powers; and providing penalties for violations of the provisions of the act; and providing for the method of appointment, compensation, and for the maintenance of his office.

Section 1. Be it enacted, etc., That there shall be established in the Department of Public Safety, in all cities of the first class in this commonwealth, to be known as "the Office of Fire Marshal." That the Director of Public Safety shall appoint, subject to the approval of select council, a suitable person, who shall be a citizen of the State and a qualified elector of said city, as fire marshal, who shall devote his whole time to the duties of his office, and who shall hold office until his successor is appointed and qualified. The office of fire marshall to be maintained at such place as may be designated by the Director of the Department of Public Safety; *Provided,* that whenever an officer of the Police Department in any city of the first class has heretofore been appointed as fire marshal, he shall continue to hold office and act as fire marshal under the terms and provisions of this act until his term of office shall have expired, or until he shall have been removed for cause by the said Director of Public Safety.

Section 2. The Director of Public Safety is hereby empowered and required to appoint such number of assistant fire marshals as the city councils may allow, one of the said assistants to be designated as chief assistant. The duties of said chief assistant and assistants shall be to assist the fire marshal, and such appointees may be removed for cause by the said Director of Public Safety.

Section 3. In the event of a vacancy in the office of fire marshal, or during the absence or disability of that officer, the chief assistant marshal shall perform the duties of the office, or, in his absence, one of the assistants to be designated by the Director of Public Safety.

Section 4. The Director of Public Safety is hereby empowered to appoint such office assistants as the city council may allow, as being necessary for the proper and efficient conduct of his office; *provided,* nevertheless, that all rules and regulations heretofore made by councils of any city of the first class for the regulation and conduct of the office of fire marshal, not inconsistent with the terms of this act, shall be valid and binding.

Section 5. The fire marshal may order the inspection of all buildings used for business or private purposes, and all buildings used for public purposes—meetings, exhibitions, or theatrical or operatic performances, or any amusement place—and enforce all laws relating to the same; and no license shall be issued by the mayor until approved by the fire marshal. He and his assistant fire marshals shall have the power to enter and inspect buildings as aforesaid, including their contents and occupancies, as provided under section nine of this act, and it shall be the duty of such fire marshal to report to the Director of Public Safety any faulty or dangerous condition found; and no license under the provisions of any law may be necessary to use said buildings for any purposes herein named shall be issued, or, if issued, shall not be available for said use until the faulty or dangerous condition is remedied; and said fire marshal shall, if he find any temporary property to be used in any building for scenic or spectacular purposes is made of or composed of highly combustible material, he shall forbid its being taken in said building.

Section 6. The fire marshal of every city of the first class of this commonwealth shall make, or cause to be made, an investigation of the cause, origin and circumstances of every fire occurring in such city by which property has been destroyed or damaged, and shall especially make investigation as to whether such fire was the result of carelessness or design. Such investigations shall be begun immediately after the occurrence of such fire, and the fire marshal shall have the right to supervise and direct such investigation whenever he deems it expedient or necessary. The officer making investigation of fire shall forthwith notify said fire marshal, and shall within one week of the occurrence of fire furnish to the said fire marshal a written statement of all facts relating to the cause and origin of the fire and such other information as may be called for on blanks provided by said fire marshal. The said fire marshal shall keep in his office a record of all fires occurring, together with all facts, statistics and circumstances, including the origin of the fires, which may be determined by investigations provided by this act; such records shall at all times be open to the public inspection.

Section 7. The fire marshal shall, when in his opinion further investigation is necessary, take or cause to be taken the testimony, on oath or affirmation, of all persons supposed to be cognizant of any facts or to have means of knowledge in relation to the matter as to which an examination is herein required to be made, and shall cause the same to be reduced to writing; and if he shall be of the opinion that there is evidence sufficient to charge any person with the crime of arson, or of conspiracy to defraud, or criminal conduct in connection with such fire, he shall cause such person to be arrested and charged with such offense, or either of them, and shall furnish to the proper prosecuting attorney all such evidence, together with the names of witnesses and all of the information obtained by him, including a copy of all pertinent and material testimony taken in the case; and shall report to the mayor, as often as such mayor shall require, the proceedings and the progress made in all prosecutions under this act, and the result of all cases which are finally disposed of.

Section 8. The fire marshal and the chief assistant fire marshal and assistant fire marshals shall each have the power to summon and compel the attendance of witnesses before them, or either of them, to testify in relation to any matter which is by the provision of this act a subject of inquiry and investigation, and may require the production of any book, paper or document deemed pertinent thereto by them or either of them. Said fire marshal and chief assistant fire marshal and assistant fire marshals are each hereby authorized and empowered to administer oaths and affirmations to any persons appearing as witnesses before them. Any witness who refuses to be sworn, or who refuses to testify, or who disobeys any lawful order of said fire marshal, chief assistant or assistant fire marshals, or who fails or refuses to produce any book, paper or document touching any matter under examination, or who is guilty of any contemptuous conduct after being summoned by them, or either of them, to appear before them or either of them, to give testimony in relation to any matter or subject under investigation as aforesaid, shall be deemed guilty of a misdemeanor, and, on conviction before any magistrate, shall be fined twenty-five dollars, or, in default of such payment, imprisoned in the county prison not more than thirty days. Said fire marshal and his subordinates, or either of them, shall have authority at all times of day and night, in the performance of the duties imposed by the provisions of this act, to enter upon and examine any building or premises adjoining or near the same.

Section 9. The fire marshal and his chief assistant and his assistants shall have a right at all reasonable hours, for the purpose of examination, to enter into and upon all buildings and premises within their jurisdiction. Whenever any said officers shall find any building which, by reason of age and dilapidated condition or for any other cause is especially liable to fire, and which is so situated as to endanger other buildings or property, or so occupied that fire would endanger persons or property therein, and whenever any such officers shall find in any building or upon any premises highly combustible or explosive materials, oils, and greases, or conditions and combinations dangerous to the safety of said buildings or premises, they shall order the same to be removed or remedied, and such order shall be forthwith complied with by the owner or occupant of said buildings or premises; *provided,* however, that if the said occupant or owner shall deem himself aggrieved by such order, he may appeal in writing to the Director of the Department of Public Safety within three (3) days after having received notice of the decision of the fire marshal, specifying in such appeal the reasons and ground therefor. The Director of Public Safety shall immediately refer such appeal to a commission, which shall consist of the Chief of the Fire Department, the Chief of the Bureau of Building Inspection, and the Secretary of the Philadelphia Fire Underwriters' Association. Said commission shall carefully consider said appeal and make decision thereon and its decision shall be conclusive. The decision of any two shall be the decision of the commission. Failing to comply with the orders of the authorities above specified shall be deemed guilty of keeping and maintaining a nuisance detrimental to life and property, and, on conviction before any magistrate, be fined twenty-five dollars, or, in default of such payment, imprisoned in the county prison not more than thirty days.

Section 10. The fire marshal shall not engage in any other business, and he or one of his assistants shall at all times be at the office of the fire marshal ready for such duties as are required by this act.

Section 11. The fire marshal shall submit annually, as early as consistent with full and accurate preparation, and not later than the first day of January in each year, a detailed report of his official actions to the mayor and councils, included in the annual report.

Section 12. The fire marshal, his chief assistant and inspectors, may examine all buildings upon which any fire escape may be erected, shall see that it is kept in good order and repair, and no person shall at any time place any incumbrance of any kind whatsoever upon any of said fire escapes or passageways constructed or intended for the escape of persons from the premises in case of fire. Any owner or occupant of buildings or premises failing to comply with the orders of the authorities above specified shall be deemed guilty of keeping and maintaining a nuisance detrimental to life and property, and, on conviction before any magistrate, be fined twenty-five dollars, or, in default of such payment, imprisoned in the county prison not more than thirty days.

All acts or parts of acts inconsistent with this act are hereby repealed.

Approved—The 8th day of June, A. D. 1911.

JOHN K. TENER

The foregoing is a true and correct copy of the Act of the General Assembly No. 281.

ROBERT MCAFEE
Secretary of the Commonwealth

OPINION OF COUNSEL ON THE FIRE MARSHAL ACT NO. 281, JUNE 8, 1911

The powers conferred upon the fire marshal under the act may be summarized as follows:

(a) To order the inspection of all buildings "used for business or private purposes, and all buildings used for public purposes," and enforce all laws relating to said buildings (Sec. 5). Under the previous act his powers of inspection applied only to "buildings of a public character" (Act of 1903, Sec. 4), and to buildings of a certain kind, viz: livery stables, hayboats and vessels, etc.

(b) To inspect fire escapes (Sec. 12). This also is a newly conferred power.

(c) To order the removal of buildings "especially liable to fire and which are so situated as to endanger other buildings or property" (Sec. 9). This also is a newly conferred power.

(d) To order the removal from any building or from any premises "highly combustible or explosive materials, oils and greases, or conditions and combinations dangerous to the safety of said buildings or premises" (Sec. 9). The previous act gave the marshal no power to order the removal of, but only authorized him to serve notice as to the existence of explosives or combustibles on premises (Act of 1903, Sec. 3).

(e) To forbid "temporary property to be used in any building for scenic or spectacular purposes, made or composed of highly combustible material," from being taken into building.

(f) To investigate the causes of fires (Secs. 6, 7, 8). The former act conferred upon the mayor the authority to initiate an inquiry into the cause of fires. The present act confers power to that end upon the "fire marshal, the chief assistant fire marshal and assistant fire marshals" (Sec. 7). For the purpose of enabling him to discharge his duties adequately, certain new powers are conferred upon him which may be summarized as follows:

(a) The power to enter all buildings, public or private (Secs. 8 and 9).

(b) The power to summon, swear and examine witnesses, and to require the production of books, papers, etc. (Secs. 7 and 8).

A most important power conferred, and one which gives general effectiveness to the act, is the power to condemn dangerous premises and conditions. This power is vested in him by the ninth section of the act. This section, after conferring upon the fire marshal and his assistants the power to enter all buildings, provides as follows:

> Whenever any said officers shall find any building which, by reason of age and dilapidated condition or for any other cause, is especially liable to fire, and which is so situated as to endanger other buildings or property, or so occupied that fire would endanger persons or property therein, and whenever any such officers shall find in any building or upon any premises highly combustible or explosive materials, oils and greases, or conditions and combinations dangerous to the safety of said buildings or premises, they shall order the same to be removed and remedied, and such order shall be forthwith complied with by the owner or occupant of said buildings or premises; *provided,* however, that if the said occupant or owner shall deem himself aggrieved by such order, he may appeal in writing to the Director of the Department of Public Safety within three (3) days after having received notice of the decision of the fire marshal, specifying in such appeal the reasons and ground therefor. The Director of Public Safety shall immediately refer such appeal to a commission, which shall consist of the Chief of the Fire Department, the Chief of the Bureau of Building Inspection, and the Secretary of the Philadelphia Fire Underwriters' Association. Said commission shall carefully consider said appeal and make decision thereon, and its decision shall be conclusive. The decision of any two shall be the decision of the commission. Failing to comply with the orders of the authorities above specified shall be deemed guilty of keeping and maintaining a nuisance detrimental to life and property, and, on conviction before any magistrate, be fined twenty-five dollars, or, in default of such payment, imprisoned in the county prison not more than thirty days.

In my opinion, the subject-matter of the act constitutes a proper subject-matter for the exercise of the police power of the State. It would seem to be no longer debatable that the sovereign, by means of the exercise of its police power, may prohibit the maintenance of conditions which endanger life and property by reason of the unreasonable fire hazard thereby created.

I am also of opinion that the mere fact that the terms of the act are so broad that conceivably they might be enforced in an arbitrary manner does not, *per se,* invalidate it.

In my judgment it is too clear for debate that the statute is self-executory and the duties and powers of the act are imposed upon the fire marshal without any action upon the part of councils. The act does not purport to be one enabling cities of the first class to create an office and clothe the incumbent with certain duties and powers. By Section 1 the duties and powers are directly imposed by the act itself on an existing officer, viz: "Whenever an officer of the police department of any city of the first class has heretofore been appointed as fire marshal he shall continue to hold office and act as fire marshal under the terms and provisions of this act until his term of office shall have expired," etc.

A fire marshal has, I understand, been appointed and now holds the office.

Yours very truly,

JAMES COLLINS JONES

(Counsel Phila. Fire Prevention Commission)

EXHIBIT 2

PRELIMINARY, AND FIRST ANNUAL, REPORTS OF FIRE PREVENTION COMMISSION

MR. GEORGE D. PORTER,
Director Department of Public Safety
City Hall, Philadelphia

Dear Sir:

In accordance with your recent request, we are submitting herewith the results of a brief inquiry showing (1) the general organization of the public and private agencies directly concerned with fire prevention and protection; (2) the broad lines of procedure followed by these agencies; (3) the more obvious defects in organization and administrative methods of the municipal agencies; and (4) certain tentative proposals for the correction of the more serious defects so far as this can be effected with the equipment and financial resources already available.

There are eight different divisions of the city government performing specific functions related to fire prevention and protection; namely, the *bureaus of water, gas, building inspection, police, fire, boiler inspection, electrical,* and the *division of fire marshal.* Obviously, an effective program of fire prevention and protection requires that these eight agencies work in complete harmony; each reinforcing and supplementing the work of the other in the performance of its special functions. Besides these municipal agencies there are numerous private organizations equipped to render important service in a well-planned and efficiently-directed program. Generally speaking, no such plan has been formulated. There is, accordingly, much overlapping of functions, lack of correlation, and failure to meet some of the most urgent requirements of a safe and sound policy.

Potentially the most important factor in a program of fire prevention, as distinguished from the control of conflagrations, is the *fire marshal's* office operating under an excellent new law. In this office rests the power and the responsibility for determining, by inspection, conditions that endanger life and property by reason of hazardous occupations, careless methods in conducting such occupations, slovenly housekeeping, and inadequate preventive measures. The fire marshal is clothed with adequate power, under State law, to enter and inspect all buildings. He is given authority, when a building is shown by inspection to be specially liable to fire, to be so located as to endanger other buildings, or so occupied that fire would endanger persons or property therein, to order the correction of the dangerous conditions. Owners and occupants are required by the law to comply at once with the fire marshal's orders, subject only to appeal to a commission provided for by law.

Notwithstanding these broad powers, the office of fire marshal concerns itself almost exclusively with attending fires and investigating their causes, prosecuting cases of suspected arson, inspecting the aisles and exits of theaters and moving-picture places, inspecting places containing explosives and highly inflammable materials, and investigating matters related to fire escapes. Practically no attention is given to the correction of housekeeping and occupancy conditions that are chiefly responsible for an annual fire loss of approximately $2,500,000 in Philadelphia.

The approximate average per capita fire loss for Philadelphia of $1.65 is not so bad compared with other American cities, but it must be recalled that Philadelphia has fire limits almost coincident with the county lines, making very extensive fire limits, and within the fire limits it has a tremendous number of buildings of virtually fireproof exterior—brick with metal roof; the whole situation making a low fire loss normal as compared with the much more restricted fire loss of Boston. Compared with foreign city averages it is obvious at once how much can be saved in Philadelphia. The following table, based upon the latest available data gathered up to 1907, shows the average annual per capita fire loss for the United States at large and the principal cities of the United States and Europe:

CITY	AVERAGE PER CAPITA FIRE LOSS (ANNUAL)
United States	$3.00
Cleveland	1.18
Washington	1.19
Baltimore	1.29
Chicago	1.43
Philadelphia	1.65*
New York	2.60
Boston	5.15
Berlin	.25
Bremen	.38
Paris	.47
London	.50
St. Petersburg	1.42

The fire marshal's office may therefore be regarded as the *weakest link* in the chain of official agencies concerned with fire prevention and protection. The organization and administrative methods of the office are such that the important functions for which it is constituted cannot be performed with reasonable economy and efficiency.

---

*The total fire loss for Philadelphia for 1911 was $2,100,000, making a per capita loss of $1.45.

The fire marshal has given an unduly narrow and perfunctory interpretation of his legal powers and duties. He has expressed the opinion that the law of June 8, 1911, gives him no authority over places used for public gatherings, except to inspect aisles and exits; that the clause "dangerous and faulty conditions" refers to construction only, and not to conditions of occupancy and housekeeping; and that a city ordinance must be passed before the law becomes effective.

One of the four assistant fire marshals has given his time exclusively to the supervision of ten fire escape inspectors, leaving only three officers to perform the functions assigned to assistant fire marshals. The records of inspections made by the ten fire escape inspectors show that these inspections have not been made with desirable dispatch; the average rate of inspection for eight months having been five to seven per day.

The current and summary records of work done and results accomplished are incomplete, inadequate, and not adapted to the purposes of administrative control. Little use is apparently made even of such records as are maintained to improve the quality of service rendered by individual inspectors or by the organization as a whole, to bring out the chief problems with which the office is concerned, or to point the way toward more effective control of fire waste.

The preliminary report now submitted is not assumed to cover the field in a complete or systematic manner. It is intended rather to demonstrate the need for a more comprehensive and thorough investigation of the problems of fire prevention and protection with a view to the formulation of a constructive plan for a more effective organization of the several public agencies concerned and for better working relations between these agencies—the Fire Underwriters' Association, the Fire Insurance Patrol, and other private organizations engaged in similar activities.

In order that such a program may be formulated and the interest of the entire community enlisted in its promotion, we would respectfully suggest that you request the mayor to authorize immediately a complete reorganization of the fire marshal's office and to appoint a commission of nine citizens of proper qualifications to ascertain the necessary facts and, on the basis of its findings, to formulate a program adequate to meet the needs of the community, and to coöperate with you in the reorganization of the fire marshal's office.

We would respectfully urge that you have printed for general circulation the city fire marshal act of Philadelphia, together with a completely explanatory opinion of the city solicitor sustaining the same along the lines of the attached circular from Fire Commissioner Johnson of New York City, which explains the Hoey fire prevention law, and gives the opinion of the city solicitor respecting its salient features.

Very truly yours,

CHARLES A. HEXAMER
Secretary Philadelphia Fire Underwriters' Association
(Past President National Fire Protection Association)
JESSE D. BURKS
Director Bureau of Municipal Research
POWELL EVANS
Chairman Fire Prevention Committees:
Bureau of Municipal Research;
National Hardware Association;
National Association Sheet Metal Contractors;
(Formerly National Association of Creditmen;
National Association of Manufacturers)

Special
Committee
Appointed by
Director of
Public Safety
March 16, 1912

FIRE PREVENTION COMMISSION FIRST ANNUAL REPORT

MR. GEORGE D. PORTER Room 420, City Hall, January 1, 1912
Director of Public Safety
City Hall, Philadelphia

Dear Mr. Porter:

The Philadelphia Fire Prevention Commission makes herein its first working report with respect to fire control in this city. Our preliminary report went to you March 16, 1912, and thereafter the commission held sundry meetings which resulted in the arrangement for these headquarters in the City Hall, with an active management in charge, becoming effective November 25th last.

Our work followed the general lines of investigation laid out in the preliminary report. There is little need of elaborating on the statement made in this report as to the existing fire waste in the city of Philadelphia, except to draw your attention to the fact that the fire waste in this city in the current year exceeded three millions of dollars—quite an increase over the average of the previous years. We would call your attention to the fact that subsequent investigations since this preliminary report have confirmed the forecast named therein as to the possibility of so improving the control of fire waste as to largely reduce the past or present figures.

There is no question but that the control should be undertaken with property as a basis before a fire occurs instead of confining the city's activities to putting out fires after they have occurred. Active firemen, policemen and members of several other bureaus have been charged for years with inspection of theaters and other public assembly halls; and after the Bodine street fire a couple of years ago, which occasioned the loss of many firemen's lives, an effort was made to start general inspections, which was abandoned within a few months thereafter because of the protest of the property owners and the failure of the firemen to insist upon this right. Measurably political influence was a factor in this easy retreat from this line of activity.

Inspection duty throughout the city has generally heretofore been perfunctory, with little or no coöperation, no regular filing or comparison of reports or actual use of them thereafter, to better conditions. Undoubtedly, the men best fitted to find out the many dangerous fire conditions in the city are those whose duty it is to enter buildings and extinguish fire when it occurs. The truth is beginning to be realized that American cities are safe from conflagration only by the smallest margin, and sometimes, by reason of extraordinary conditions, that margin disappears entirely and then the best fire department in personnel and equipment may become helpless. Yet the large majority of American cities continue to take this chance, instead of directing new energy into the line of preventive work, as a number of our cities have already done with great success, and as European cities have done for many years with unmistakable resultant benefits.

Intelligent and effective inspection of properties, particularly of mills, factories and warehouses, in the congested city limits, would undoubtedly result in awakening owners to existing dangers of many kinds, which could easily be remedied before they reflect themselves in fire waste. The city generally, the property holders, the insurance companies, and the fire department itself would reap the benefits of this reduced danger and loss. Such inspection is also undoubtedly essential to reduce the crime of arson—recently proved in New York to be more extensive and dangerous than heretofore imagined—to its lowest limits.

The Fire Marshal act of the city of Philadelphia undoubtedly gives your department the power to do every essential thing to control fire waste danger in this community. No city ordinance is necessary to supplement this legislative act for enforcement of the State law, and you can accomplish the appointment of as many assistant fire marshals as your discretion directs to carry into effect your policy immediately. It may be said in passing that it is incumbent upon you to promptly readjust the fire headquarters and the fire marshal's office so as to make them administratively efficient, if any real value is to be derived from this proposed new service.

This commission has investigated the eleven battalion headquarters, with their total of 85 constituent engine, truck, chemical, pipeline and fireboat companies—

> First—to meet the personnel of the force.
>
> Second—to construct a geographical map of the city with the lines of these battalion areas determined by common consent of all concerned, so as to be contiguous, and in the aggregate make a map of the whole city. A copy of this area map is on file in the rooms of this Commission.
>
> Third—to make a time map of the actual use of time by the entire force on roll-call so as to find out what their existing duties are, what they should be, what time is available and what time can safely be set aside for active inspection work.
>
> The great scope of this study has made it impossible to complete it to date, but it has already covered 26 of the 56 engine companies, and 8 of the 16 truck companies for a roll-call period of 10 days, which has given us the essential data on which we can safely formulate suggestions.
>
> Fourth—while studying actual conditions with respect to area and occupation in this city we have been engaged in investigating similar lines of action in other American cities that have followed a more active and advanced policy in this regard than we have, for periods ranging from one to ten years, to check our own proposals in the light of experience instead of formulating them theoretically. The result has shown us that 36 cities are carrying out with marked success a reduction of fire loss of life and property—the essence of all we desire to accomplish here.

The result of this investigation leads us to the unqualified conclusion that at least 1 active fireman from each of the approximate 80 companies should be constantly on inspection work from 8 a. m. to 5 p. m.; and further, that virtually one-quarter of the total force of a thousand men could reasonably in the near future be sworn in as assistant fire marshals, clothed with authority to make such inspections and reports to their superiors, these reports to be forwarded to headquarters for review and action thereon.

This assignment will average 44 actual week hours for a company, whereas the average company now has 75 average week hours surplus over their minimum requirements after the present allowance for meals, other assignments, sickness, absence and injury from all causes (the present consumption of time being largely reducible by better administrative methods).

This force should be able to cover an enormous amount of actual inspection in a relatively short time, as witness the fact that 50 active firemen in the city of Cincinnati have inspected, between July 10, 1912, and January 1, 1913, 45,863 buildings through regular day hours. The betterment of conditions in Cincinnati has been remarkable since this effort was undertaken.

Similar activity in the city of Rochester has cut the fire waste in half during the past two years.

Similar activity in the city of Youngstown, Ohio, has reduced the fire waste within ten years to one-tenth of the figures at that time, without taking into consideration the increased population and property during this decade.

The authority for this line of action and its propriety in view of actual conditions here are both quite beyond question at this time.

We advocate the immediate detail of at least 6 active firemen including 1 officer, as an initial inspection corps under the authority of the Fire Marshal act, this corps to be sent promptly to New York City and drilled in their Fire Prevention Bureau (now the most active and intelligent in the country) for a week; this corps upon return to act as a nucleus of the great service.

We have also studied with care the form and use of reports not only of the active firemen on inspection duties but of all related bureaus in the city government, and have through a sub-committee of this commission proposed a form of report which is largely automatic, and which when filled out constitutes a real check on the property inspected—this report to go through headquarters for inspection and to be compared with insurance bureau surveys to which we now have access.

The great danger in all cities is in the congested centers and in the factory and warehouse districts, and it is proposed that this first inspection work shall be largely centered in such areas, with the general instruction to all concerned that the cleaning up of unnecessary rubbish and the reporting of physical defects in building construction and equipment, easily remediable, shall first receive special attention.

We have found that in the cities of New York and St. Louis there is a fixed requirement that the second line of hose from the engine or engines first reporting at a fire shall, immediately upon the first line of hose showing its inability to extinguish the fire, connect with the outside outlet of the sprinkler system and employ this additional distribution of water without fail. Although this city is filled with sprinkler systems there has been no such connection on the part of the firemen for years. We unqualifiedly recommend that such an order be issued at once.

We have learned from many cities that a regular periodic test is made of fire apparatus; in some of them of hose. The rule seems to be that pumping machinery shall be overhauled at least twice a year, and shall be tested in some reasonable and practical way to not less than 90 per cent. efficient—usually 95 per cent.

As fire apparatus here has not been regularly tested for many years, and some engines admittedly show lack of efficiency up to 35 per cent., we unqualifiedly advise prompt measures to correct this evil.

Too much of our city apparatus is obsolete and inefficient. Compared with many other cities we are far behind in the protection this department can give the citizen and property in this community because of lack of funds to purchase sufficient apparatus in quantity and quality to bring our fire department up to a reasonable point of efficiency. It is most important that the citizens of Philadelphia should realize that money must be spent on this item if they are to be safe from fire danger in this community now and in the future.

We summarize our recommendations, briefly enlarged upon above, as follows:

1. That the Fire Marshal act, with opinion of counsel attached, be printed in pamphlet form in large quantities for general distribution throughout the community by inspectors when visiting properties, and generally throughout all channels, for the purpose of publicity and education—this to be done in conjunction with a carefully worked out plan of newspaper publicity and otherwise as can be discovered (some copies in Italian, German and Yiddish).
2. The detail of at least 6 selected firemen, headed by an officer, to be assistant fire marshals as a nucleus of a large inspection force to begin immediate inspection service.
3. The selection of approximately one-quarter of the active fire-fighting force (3 men from each company) and their induction as assistant fire marshals for inspection purposes, as outlined above in this report. The detail for proper and limited hours of a fire engine from each house upon the initiation of this inspection service to travel through the streets of the section of the city appropriate to said house, carrying notices of the inspection and requiring that premises be cleaned up.
4. The preparation and printing of a proper manual for firemen and fire marshals.
5. The regular schooling of the entire fire-fighting and fire-prevention forces in fire prevention and protection.
6. The immediate regular test and repair of fire apparatus and the elimination of all unnecessary and peculiar defects in the present fire department service.
7. Coördination of all city inspection services to the practical extent possible to assist the above defined fire inspection proposals.
8. The study of all city inspection agencies with a view to their consolidation into a general inspection bureau, and the preparation of a State act to this end.
9. The preparation of a State act based on the study made by the commission to date of existing conditions, covering the storage of gasoline, naphtha, etc., as now used throughout the community.
10. The adoption and application of an adequate physical and mental test to apply to all fire-fighting personnel.
11. The public nomination of two city "Fire Prevention Days"—one preferably some time in April (before moving day), and the other preferably in October (before starting winter fires), the practical observance of these to be urged upon all citizens by every practical means.

12. The calling of a National Fire Prevention Congress under the auspices of the city, carried out through the medium of this commission, at some appropriate period during the late Spring (in May, immediately after the annual meeting of the National Fire Protection Association in New York City, so that insurance engineers in numbers can conveniently attend), or in early Fall (about the middle of October, which may prove a better date as giving more time to organize the large subject, as well as coming after the adjournment of various State legislatures which demand time and attention from State and city officials up to midsummer) of 1913, to advance the uniform activities of States and cities throughout the country to abate American fire waste and its resultant loss of life and property and the reflection thereof in the current cost of insurance.

Yours very truly

PHILADELPHIA FIRE PREVENTION COMMISSION
POWELL EVANS, *Chairman*

EXHIBIT 3

Room 420, City Hall, April 18, 1913

MR. GEORGE D. PORTER
Director of Public Safety
Philadelphia

SIR:

INSPECTION OF THEATERS

During the past month we have discussed with you in a general way the supposed present practice of control of the various departments for theaters, public assembly halls, fight clubs, etc., which concisely is as follows:

DIVISION OF FIRE MARSHAL

Each of the three assistant fire marshals inspects theaters in his district about every two months as to aisles, exits and buckets; and there is also a semi-weekly inspection of the amusement places of which no report is made. Supervision is actually very lax and inefficient, as investigations made during the past few weeks fully disclose.

BUREAU OF FIRE

Each district engineer is supposed to inspect monthly all theaters in his district. A fireman is assigned to every performance, supposedly of each theater, to inspect the entire building before and after the performance, to examine fire appliances and to prevent smoking. This service is very loose and ineffective, green men being often assigned without intelligent training or instruction, and clothed with little effective authority, as shown by our investigation during the past few weeks.

ELECTRICAL BUREAU

Inspects electric wiring in theaters weekly.

BUREAU OF POLICE

Patrolmen inspect theaters for overcrowding each performance (?).

BUILDING INSPECTION BUREAU

Passes upon plans and construction work of theaters and all alterations thereto.

There is little or no coöperation between these departments and practically no reports are filed. As there are 44 of these places in all, housing an average of anywhere from 40,000 to 50,000 each performance, or 10,000,000 to 12,000,000 individuals once annually—if all open for about half of each year—it is apparent how really necessary it is to the Philadelphia public that adequate safety measures be uniformly devised, adopted and enforced.

Your attention is directed to the irregular yet numerous disconnected inspection efforts applying to theaters by many municipal departments. The heaviest drain for this purpose is on the fire department, which at each performance has present a uniformed fireman at 24 of these theaters.

By Chief Edwin Clark, of the Bureau of Building Inspection, we are advised that the houses shown on the attached list have taken out licenses to operate as theaters.

From Acting Chief Meskill, of the Fire Department, we learn that the theaters on the attached list are furnished a uniformed fireman for each performance. You will note that there are 12 houses which, while operating as theaters, do not secure services similar to other houses of the same occupancy.

We further attach a list of houses—eight in number—which are theaters and which operate on the same basis as houses licensed as theaters, but which do not secure the services of a fireman nor take out a theater license.

The presence of a fireman on theater detail for afternoon and evening performances means a loss of service, including meals, practically from noonday to midnight, and he is called upon to make no report nor instructed in any way as to his duties, making no regular rounds.

This heavy drain upon the fire department would be further enlarged if similar service is extended to all houses of like class.

This commission, realizing the inefficiency and expense attending the practice as regards theaters, has made personal inspection of many theaters and finds violations of good practice justifying our submitting:

FORMS A-B-C-D

embodying a practical working scheme of the house management—may very effectively carry out an efficient and constant system of inspection work.

Form A, entitled "REGULATIONS REGARDING THEATERS," would be made in placard form on heavy cardboard, and at least two cards furnished each theater.

In the first five clauses there is a brief outline of the duties of the employees of the house.

Form B is the form upon which the house employees are to make out a report of their work.

Form C is a division into districts of the theaters throughout the city.

Form D is a report form for the weekly inspection of the district inspector in company with the chief of the fire patrol of the particular house inspected.

Briefly stated, it is the thought that the management of a theater should appoint two employees to act as a fire patrol, these men to be instructed and checked in their duties by a uniformed fireman-inspector who will rotate irregularly but frequently among the houses in his particular district. In order that these inspectors will touch each particular house at least once a day during performances and be free to go back the same day to any house about which they may have suspicions, we have divided the number of theaters into six districts, which in working out the scheme it may be necessary to slightly increase.

These district inspectors are required to fill out Exhibit 3 card, showing the time of their visit and the men on duty as fire patrol, which must harmonize with the report from each house furnished each day direct to the chief of these inspectors by the fire patrol.

The several district inspectors will of course be quite busy going from house to house to check the presence of the fire patrol during performances, but each morning will provide them with ample time to make a detailed inspection of one of the houses in their district, and this inspection will be reported to the chief of the inspectors on Exhibit 4 card, which calls their attention to all features of fire prevention and precaution.

As you will see, with the coöperation of the management, the 25 or 30 men now draw from the fire department for this work can be reduced to 25 per cent. of this number and a much better result obtained.

Prior to inaugurating the proposed scheme it will be necessary to educate six men and a chief in the detail duties expected of them. It will further be necessary to explain fully to the management of the theaters their part in this work.

Following this the employees selected for the fire patrol of each house must be brought together and instructed as a body and later taken to their particular theater and instructed in the application of their new duties. It will also be necessary to secure badges, so that both the inspection corps and the fire patrol are easily identified. It will also be necessary to have printed in sufficient quantities the several forms suggested.

The proposed scheme is copied closely after that now in use in the city of Boston, and it strongly recommends itself to the commission in view of the fact that many of our theaters are of poor construction and that cripples and men entirely new in the fire department are selected as a detail for this work. Because it is a generally recognized fact among the firemen now that they have no power and must take the abuse of the theater employees if they hope to retain the detail.

The above suggested economy and increased efficiency is opportune and in harmony with the suggested changes for theaters as now under construction before issuing licenses, and it might be well, owing to the amount of work to be done before inaugurating this scheme, that it be carefully rehearsed during the off (or summer) season so that it can be promptly started upon the opening of houses in the early fall.

Very truly yours,

PHILADELPHIA FIRE PREVENTION COMMISSION

POWELL EVANS, *Chairman*

FORM A

DEPARTMENT OF PUBLIC SAFETY

Public Assembly Division

Bureau of Fire

Regulations Regarding Theatres

PHILADELPHIA.

1 There shall be two or more employees appointed, after examination and approval by the Department of Public Safety, who shall be present at least one-half hour previous to the raising of the curtain, remaining during the performance, and until the performance is completed. One of these in case of fire shall have supreme command over all House employees until the arrival of a member of the Bureau of Fire, and they will be required to wear, in full view a badge furnished by the Department of Public Safety They will be known as the "Fire Patrol"

2 The Chief of the Fire patrol shall call the employees together at least once each week for the purpose of holding drill Each employee will be assigned a position which he will occupy in case of fire and he shall be instructed to remain in that position from the receipt of the fire signal until he is relieved by the Fire Patrol.

3. One of the Fire Patrol shall be stationed at the "Prompt" side of the stage and he will be the person to give the alarm to the City fire department, regardless of instructions to the contrary from other persons. Another fire patrol whenever possible shall be stationed on the opposite "Prompt" side of stage.

4. Before each performance, the fire patrol shall cause the fire curtain to be tested and shall once each week examine thoroughly all fire and exit appliances to ascertain their condition and readiness for use in case of fire, this in company with a uniformed inspector of the fire patrol. This weekly inspection of appliances to be reported on blanks furnished by the Department of Public Safety mailed to them same day of inspection.

5. At the beginning of the theatrical season the Chief of the Uniformed theatre inspectors will call the members of the Fire Patrol of the several theatres to the District Chief's headquarters for instructions, and the practice to also be carried out in event of a change in the personnel of the Fire Patrol during the season.

IN CASE OF FIRE KEEP COOL.

6. FIRST OF ALL, PULL THE CITY AND PRIVATE THEATRE FIRE ALARM BOX. This is important and must be observed.

7 Have a place for everything, especially fire extinguishing and prevention appliances, and insist on each being kept in its place.

8. Keep all exits and passages to fire appliances clear of obstruction.

9 Fire buckets, casks and tanks to be kept filled with water at all times and to be used for fire only.

10. Fire extinguishers to be kept in condition for use at all times, covers of extinguishers to be removed and contents stirred once during each season and the extinguisher re-charged twice a year, and the date thereof recorded on tag attached. Care should be taken that the rubber hose attached is in good condition.

11. Keep all scenery away from fire appliances and exits.

12. CANDLES IF USED MUST BE IN METAL CANDLESTICKS WITH EXTRA WIDE BASES.

13. The stage must be kept clear and clean when not in use.

14. All waste paper or rubbish must be deposited in a metal can with a cover, and must be emptied each day

15. ALLOW AXES AND PLASTER HOOKS TO BE USED ONLY IN CASE OF FIRE.

16. Do not hang articles on fire appliances or on gas or electric fixtures

17 Keep a blanket on each side of the stage, to be used in "smothering" or "spanking" fires.

18. Keep buckets filled with sand near all electrical switches, fuses, and cut-out boxes, also a metal scoop for same Buckets to be stenciled (FOR FIRE ONLY)

19 NO SMOKING This regulation must be strictly enforced throughout the entire house.

20 Keep a small metal box in "first" entrance in which to deposit cigar or cigarette stubs brought from the stage

21 Permit only safety matches to be used and same to be placed in a metal container when not in use.

22. When colored fire is used the same must be fired in a metal receptacle and a pail of water should be handy The receptacle should be cooled in the pail of water before being put away

23 If gas is used one person will be assigned to light all the jets.

24 Have illuminated transparency or electric light over private fire alarm boxes where it is inside the building. The same to be kept lighted at all times during the performance

25 Keep fire escapes and exits to same clear at all times, and well lighted during performance Brilliant and prominent signs to indicate same. Particular attention should be given to the escapes in cold and stormy weather Keep all movable parts well lubricated

26 Have all hose taken from racks or reels during each weekly inspection at that time it should be swept free of dust and if damp dried before returning to its place See that hose nozzles are free from obstructions by blowing through them. Keep washer in female coupling and be sure that this coupling is screwed tightly to water pipe

27 Keep automatic ventilating sky-light free from obstructions especially in cold and stormy weather Use plenty of grease to permit of easy manipulation Have controlling rope painted red for easy recognition and prominently located at stage level.

28 Have watchman and fire patrol inspect every part of building immediately after each performance.

29 A system of signals should be in force which will notify the occupants of the dressing-rooms and fly-floors in case of fire

EFFECTIVE OCTOBER 6, 1913

FIRE MARSHAL

FORM B

Form 312 12-13 5M

DEPARTMENT OF PUBLIC SAFETY
BUREAU OF FIRE
PUBLIC ASSEMBLY DIVISION

Name of Theater .... Date................191....
Name of Fire Patrol Chief................Assistant Chief.................

	EXAMINED				PORTABLE FIRE APPLIANCES						TIME OF INSPECTION			
		Aisles & Exits Clear	No Smoking	Candle & Gas Burning	Hose	Chemical Extinguishers	Casks	Sand & Water Buckets	Axes	Hooks	Knives	First Round	Second Round	Third Round	Fourth Round
	Under Stage														
	Stage														
NORTH—WEST	Upper Fly Gallery														
	Lower Fly Gallery														
	1st Tier Dress'g														
	2nd Tier Dress'g														
	3rd Tier Dress'g														
	4th Tier Dress'g														
SOUTH—EAST	Upper Fly Gallery														
	Lower Fly Gallery														
	1st Tier Dress'g														
	2nd Tier Dress'g														
	3rd Tier Dress'g														
	4th Tier Dress'g														
	Carpenter Shop														
	Property Room														
	Boiler Room														
	Auditorium														
	1st Balcony														
	2nd Balcony														
	Gallery														

NOTE: Was asbestos curtain lowered at end of last performance and left in that position?..

When raised was it apparently in good condition?.................

At end of last performance was stage cleared and hose brought to center? ....

GENERAL CONDITION: Excellent........Good........Fair........Bad........

REMARKS (use other side):

FORM C

Form 311 9-13 1500

DEPARTMENT OF PUBLIC SAFETY
PUBLIC ASSEMBLY DIVISION
INSPECTOR'S DAILY REPORT

......District, Inspector................, Badge No....... Date.......191..

THEATER	Time Arriving	Time Leaving	MEN ON DUTY	Badge Number	REMARKS
1...............	....	....	....	....	....
2...............	....	....	....	....	....
3...............	....	....	....	....	....
4...............	....	....	....	....	....
5...............	....	....	....	....	....
6...............	....	....	....	....	....
7...............	....	....	....	....	....
8...............	....	....	....	....	....
9...............	....	....	....	....	....
10...............	....	....	....	....	....
11...............	....	....	....	....	....
12...............	....	....	....	....	....

FORM D

Form 313—9-1—750

THEATER INSPECTION
DEPARTMENT OF PUBLIC SAFETY
PUBLIC ASSEMBLY DIVISION—BUREAU OF FIRE
CITY HALL, PHILADELPHIA

Name of Theater............................Location............................
Fire Patrol Chief....................Asst. Chief....................District....................
Date of Inspection....................Inspector....................Badge No....................

ACCESSIBILITY:

From how many sides can building be reached?............................
Basement:—How many points of entrance?..........Where?..........Basement sufficiently accessible?............................
Areaway:—Particularly fire escape and exit outlets clear of refuse, ice, etc.?..........
Areaway light well to basement windows free of refuse?............................

Examined basement under auditorium and entrance?..........Condition..........
Examined auditorium and entrance?..........Condition..........
Examined balcony and entrance?..........Condition..........
Examined first gallery and entrance?..........Condition..........
Examined second gallery and entrance?..........Condition..........

EXAMINATIONS FOR OBSTRUCTIONS AND CLEANLINESS:

Basement under stage?..........Condition..........
Stage? ....Condition..........
Lower fly galleries?..........Condition..........
Upper fly galleries?..........Condition..........

Gridiron? ...... Condition ......
Carpenter shop? ...... Condition ......
Property room? ...... Condition ......
Scene dock? ...... Condition ......
Paint room? ...... Condition ......
Electricians' room? ...... Condition ......

Operated asbestos curtain? ...... Condition ......
Operated ventilating stage skylight? ...... Properly lubricated? ......
Operated fire doors? ...... Properly weighed? ......

HEAT HAZARDS:

Boilers and furnaces? ...... Location ...... How close to woodwork? ...... Properly protected? ......
Distance of flues from woodwork? ...... Are radiators or steam pipes free from combustible materials? ......

GAS STOVES:

How many? ...... Metal protection sufficient? ...... All iron pipe connections? ......

Metal cans ...... Location ...... Sufficient ......

LIGHTING:

General condition of electrical wiring ...... Open ...... Enclosed ......
Electric lamps against combustible materials? ......
Switchboard protection ...... Spot light protection ......
Moving picture machine protection ......
Gas jets clear of combustible materials? ...... Stationary ......
Swinging gas jets have guards? ...... Stationary gas jets have guards? ......
Protection over gas lights? ...... Kind ......

SMOKING:

Allowed at all? ...... Where? ...... Should it be forbidden? ......
Signs plentifully posted? ...... Rule enforced? ......

DANGEROUS MATERIAL:

NOTE.—Absolutely forbid use of naphtha and similar oils for cleaning and lighting purposes.
Quantity and care exercised in storing and handling of powders for color and spectacular effects ......
Allow nothing but safety matches, and keep in metal containers when not in use.

EGRESS:

Exits and fire escapes clear of obstruction—and sufficient? ......
Exits and fire escapes properly designated and lighted? ......
Exits and fire escape doors swing with travel? ......
Fire escape movable parts operated? ...... Properly lubricated? ......

EXPOSURES:

Can theater protection from fires originating outside be improved? ......

PRIVATE FIRE APPLIANCES:

Chemical extinguishers: Number ...... Location ......
......
Note extinguishers in moving picture booths.
Date of charging ...... Tagged? ......
Fire pails and casks: Number ...... Location ......
......
How marked? ...... Condition ......

Sand pail at switchboard? ...... Scoop? ......

Axes: Number.................................Location.................................

....

Hooks: Number.....................Size.....................Location.....................

Blankets on stage for spanking fires.....................Condition.....................

STANDPIPE:

Number and size of risers.....................Location.....................

....

Number and size of outlets.....................Style of connection.....................

Location of outlets...

....

Standpipe supplies and condition...

Size of hose.....................Kind.....................Location.....................

Properly racked and with nozzle?.....................Condition.....................

AUTOMATIC SPRINKLER SYSTEM:

Partial or full protection?.....................Where?.....................

Location and condition (open or closed) main stop valve..............Properly marked.........

Automatic sprinkler supplies and condition.....................................

OUTSIDE ENGINE STEAMER CONNECTIONS:

Number ....Purpose.....................

Location.....................Single or Siamese?.....................

Proper signs indicating purpose?.....................Condition.....................

PRIVATE FIRE ALARM:

Kind.....................Location.....................Condition.....................

Recommendations ....

....

EXHIBIT 4

INSTRUCTIONS FOR FIRE PREVENTION INSPECTORS OF BUREAU OF FIRE

FOREWORD Philadelphia, December, 1913

The officers of the Bureau of Fire who are called upon to jeopardize their lives and limbs and those of their men because improper and unsafe conditions are allowed and who are called upon to assure immunity from the results of the terrible chances taken in the heedless way of doing things, were consulted in preparing this important work. Regular and frequent inspection service has a duel purpose of cashing in for the benefit of the citizen the experience of the firemen of the causes of fires, and the gaining of information by the inspector of the physical features of a property so that his company when called upon to enter in the darkness of night or haze of smoke, can quickly, safely and intelligently act with the knowledge gained during the inspection of entrances, stairs, elevators and trap locations, strength of construction and general character of contents. The inspection area map indicates very closely for each company, the territory wherein they would be the company sent in event of a still alarm and the first company arriving due to a box alarm calling several companies.

The firemen drafted to this service are impressed with the necessity of following the fundamental principles as outlined below in order to secure the greatest returns for their efforts.

(1) The work of fire prevention may impress you as a fad or a joke at the outstart, but your matured view will be that it is both inter-

esting and serious and in comparison with fire extinguishing it stands as a Bureau of Police to the Detective Bureau.

(2) Your sound judgment of corrections to remove fire dangers will have the backing of your superior officers against all protest, and to secure the desired result, you are to permit no hindrance in your work through fear or favor, friends or enemies.

(3) Be courteous, explain in detail your mission and do not quarrel with the occupants of any building. Remember there is a distinct advantage over the man who has lost his temper to the man in an argument with self-control. You are representing the dignity of a department of your city and must in no case initiate a quarrel, if you cannot through the courtesy of owner or occupant secure entry to a building, report the facts to the officers in charge of the fire prevention work and have them open this avenue for you.

(4) Make friends with the engineer, janitor, superintendent, or any other person in charge of the building. These men have considerable information of the property condition and influence in having corrected promptly conditions which you desire improved.

(5) This new responsibility calls for intelligence, sound judgment, broad views and amenable to reason. Narrow mindedness and bombast have absolutely no place in this work and every new and practical idea bearing on the end ultimately to be achieved should be promptly grasped and utilized.

(6) Gently and firmly decline the friendly cigar or other small article usually offered in good faith, but occasionally used by occupant or owner of property to put the inspector in a bad light. In particular guard against the least suspicion or suggestion of graft in this form and by adhering to strictly business dealings you are in a stronger position should your work be questioned or reviewed.

IN GENERAL

All reports must be made in the manner hereinafter described and must be clear, concise and intelligible.

Inspectors are instructed to hold as little converse with the owners, occupants or lessees of the premises being inspected as may be consistent with courteous treatment, and to meet such owners, occupants or lessees when instructed by the officers in charge. Inspectors are cautioned to confine their conversation strictly to the business in hand, and not to divulge to any one the nature of the report they propose making when it refers to other than minor improvements—particularly where advice is required from experts on such matters as fire escapes, exits, auxiliary fire appliances, electrical equipments, fire wall openings and fire doors.

It will be the duty of the inspectors to notify all persons present and who are responsible for dangerous inflammable conditions, that the said condition must be removed forthwith; but a report must be made on the said condition whether such notification has been given or not, stating, however, if the condition was improved.

In the Fire Marshal's office there will be maintained a chief examiner and corps for the purpose of carefully examining all reports, and each inspector is instructed to report fully and without mention to citizens his opinion as to the need of improvements on the following features:

Fire escapes, electrical equipments, auxiliary fire appliances, exits, fire retarding devices (fire doors, fire walls, wireglass windows, etc.).

Inspectors are instructed that when on an inspection of a building it is found that the building under investigation is connected with an adjoining building on any or all stories, to classify the premises concerned as *one building,* and to forward the report on same as such, specifying the various streets or avenue numbers concerned.

Inspectors are instructed that when describing a building in their reports to bear in mind that the entrance story, or the first story on a level or above the curb, is invariably the first story and must be described as such.

Basements are that portion of the premises not more than half their own height below the level of the curb, and cellars are that portion of the premises which are more than half their own height below the curb.

Inspectors are instructed when making inspection of a building to report *specifically* the exact *location* of any matter which may come under their observation as a violation or remediable feature. Where sufficient space is not found on the printed form of the report, such detail should be covered under "Recommendations."

FIRE DRILL

Definition of fire drill: The orderly vacating of a building by its occupants in the least possible time in case of emergency, panic or fire; it is to be by the nearest safe means of exit, and the use of such auxiliary fire appliances as may be approved for the extinguishment or retarding of fire.

An act of the General Assembly (261), June 7, 1911, requires fire drills in factories and industrial establishments where women and girls are employed, and duplicate copies of this act, together with general regulations and suggestions for fire drills, hereto attached, can be obtained upon application to the fire marshal.

FIRE DRILLS
IN FACTORIES AND INDUSTRIAL ESTABLISHMENTS
WHERE WOMEN OR GIRLS ARE EMPLOYED
WITH COPY OF THE ACT RELATIVE THERETO AND SUGGESTED FIRE DRILLS

386 CITY HALL, PHILADELPHIA

AN ACT

To require fire drills in factories and industrial establishments, where women or girls are employed; providing for the promulgation of rules in respect thereto, and providing penalties for the violation thereof.

Factories, etc.

Fire Drills

Rules and Regulations

SECTION 1. Be it enacted, &c., That in all factories and industrial establishments where women or girls are employed, and fire escapes, appliances for the extinguishment of fires, or proper and sufficient exits in case of fires or panic, either or all, are required by law to be maintained, fire drills shall be periodically conducted, not less than once a month, by the person or persons in charge, under rules and regulations to be promulgated, in cities of the first and second classes, by the Fire Marshal, and, elsewhere in the Commonwealth, by the Chief Factory Inspector, in which the persons employed in such factories or establishments shall be instructed in, and made thoroughly familiar with, the use of the said fire escapes, appliances, and exits; which said drill shall include the actual use of the same, and the complete removal of the persons, in an expeditious and orderly manner, by means of such fire escapes and exits, from the building to a place of safety on the ground outside.

Duty of Factory Inspectors

SECTION 2. The Fire Marshal and his assistants in cities of the first and second classes, and the Chief Factory Inspector and several deputy inspectors elsewhere in the Commonwealth, are hereby required to see that the provisions of this act are faithfully carried out.

Violations

Penalty

SECTION 3. Any person who violates or fails to comply with the provisions of this act shall be guilty of a misdemeanor, and on conviction shall be sentenced to pay a fine of not less than twenty-five dollars ($25.00) nor more than five hundred dollars ($500.-00), and to undergo imprisonment in the county jail for not less than ten days nor more than sixty days, either or both.

Approved—The 7th day of June, A. D. 1911.

JOHN K. TENER

The foregoing is a true and correct copy of the Act of the General Assembly No. 267.

ROBERT MCAFEE
Secretary of the Commonwealth

GENERAL REGULATIONS FOR FIRE DRILLS

Establishments employing women or girls are required to have fire drills not less than once a month; to aid in this, these regulations are published, and "all factories and industrial establishments" will be required to comply therewith.

Establishments that organized fire drills will continue the same and advise the Fire Marshal of the fact. All fire drills will be in charge of a supervisory organization composed of the members of the firm, or the proprietor of the establishment, with the following officers selected by them, namely:

Chief of fire drills, floor chief or captain, and such assistants as are considered necessary to take charge of the employees, fire-escapes and all stairways or other means of exit.

The chief of fire drills to be a person prominent in the business, whose position commands respect and insures compliance with all orders issued. He shall have charge of all matters pertaining to fire drill, instructions and practice, select the persons required for the positions considered necessary and enforce discipline.

The means for conveying alarms for fire drills or fire to be in keeping with the character of the building and the nature of the employment, each floor to have a person in charge, with such additional subordinates as may be deemed requisite.

Drills to be held at different hours, and alarms sent from different parts of the establishment, so that all parts of the building may be covered and all employees become proficient.

The use of the stairways, fire-escapes and fire towers is of vital importance, and absolute provision must be made to control these safeguards. Alarms for fire drills must be different from signals usually employed; when considered necessary, special gongs or a whistle may be introduced.

SUGGESTIVE FIRE DRILLS

In all drills the operators will, at the first stroke of the accepted fire alarm, cease work, remove the stock, chairs or benches nearest them from the aisles and place them out of the way; on top of the work table or under the same are especially recommended.

At the second stroke of the alarm the employees will form in files of two, using a free hand to raise the skirt, to prevent those in the rear tripping upon the same in the march.

The third stroke will be the signal to march toward the door of the exit passage, and each file will move forward, keeping a sufficient distance to give individual freedom.

The line will halt at a signal from the chief of room or captain by a motion of the arm or other signal, and will, when permitted, move to the stairway or escape and descend, subject to the orders and judgment of the stairway or escape guards.

The foregoing fire drill is suggestive in its character, but any modification of the same that is better calculated to suit the nature of the establishment will be considered upon the same being reported to this office.

J. S. Mallory
Fire Marshal

Fire Escapes

Call for new fire escapes on buildings in your recommendations on the regular report, and where in your judgment such a feature is desirable; also fill out form and attach to your report so that we in turn can place the same before the fire marshal for consideration by experts on this subject.

Do not on the sheet left with the owner or occupant while on the premises make any mention relative to the need of a new fire escape.

Please understand this does not affect any remarks you may make relative to repairs or improvements on existing fire escapes.

Fire Doors

Where a wall, otherwise unbroken, extends from the basement to a point above the roof and is pierced with an opening, be very careful in stating on your report that a standard fire door is required, and understand that a metal-lined door, if you so designate it, would not necessarily require a man to put in a standard fire door; whereas a standard fire door is the only right protection for an opening in a fire wall.

Your special attention is directed to the fact that unless a wall of brick, stone, concrete or other non-inflammable material extends from the basement floor through all stories and above the roof unbroken, or has every opening closed by a standard fire door or shutters, it is not a fire wall, and is in the case of a chain being only as strong as its weakest link. There is little to be gained by calling for an opening of a wall to be closed with a fire door unless, as above stated, the wall otherwise is a thorough cut-off.

Referring to Inspection Form 301 (pages 431, 432)

1—The inspector is instructed to state his name, company (whether engine, truck, chemical, etc.) and his company number.

2—For the purpose of correctly designating a building care should be exercised in giving the correct street number, and when a corner building has two or more entrances, the number of the principal entrance will be given as the proper address; and in a case where a building covers more than one street or avenue number, whether the said building has more than one entrance or not, all numbers of said building must be given. Example: E. K. Tryon, 10 and 12 North Sixth street and 611 Market street.

3 and 4—Since it will be necessary to place responsibility for all violations relating to the structural conditions and public parts of the premises, such as yards, halls, stairways, roofs, areas and cellars, if used in common by all the tenants, against the owner of premises, and all violations not pertaining to the above mentioned parts against the person or persons directly responsible for same, the inspector is instructed to secure the name and address of the owner or his representative, in addition to the name of the occupant.

5—For reasons mentioned under 3 and 4 the name of the occupant of each floor of a building must be set forth in full, together with the nature of the occupancy, this latter feature due to the fact that different characters of occupancy will require different treatment.

> NOTE.—A snap recommendation sheet (Form 302) to be furnished tenant to include such parts of the recommendations as are to receive their attention. Each snap recommendation sheet should state location of nearest fire alarm box.

6, 7, 8, 9, 10, 11.—These are self-explanatory, and for the direct information of the fire company of which the inspector is a member it is of particular interest, since in subdividing the city for work of each fire company the effort has been, so far as is consistent with the equal subdivision of the work, to give that portion of the city to the company due in first at the building on an alarm of fire.

12.—Many buildings, particularly in the central portion of the city, have basements that are inaccessible except through a stairway in the center of the building, or possibly an elevator at some point far removed from the entrance of the building. This an inspector, as a fireman, will appreciate, creates difficulty in fighting a basement fire; and while we do not wish the fireman inspector to issue any instructions on this feature while at the building, the fire marshal does desire his judgment as to the need of such improvements on the premises visited, together with suggestions as to the location and manner of improvements.

13.—This question should invariably be answered, and in doing so the inspector commits himself to having been through the premises from cellar to garret, and also the roof.

The following questions (14 and 15) will necessarily be answered by the inspection as directed under 13, and are for the purpose of calling special attention to locations where hazardous conditions frequently exist; also to materials which, carelessly handled, invariably create fire hazard.

16.—The insurance interests have approved a special type of metal refuse can, self-closing, standing clear of the floor. Undoubtedly the approved type is best for general purposes, but in all cases a metal can of size or number sufficient for one day's accumulation should be provided and a rule of positively emptying cans at end of day of oily waste, rags, refuse and sweepings enforced.

17.—Good practice dictates that not more than one day's supply of loose packing should at any time be brought into the building, and this in the morning, so that upon leaving at the end of the day little or no excelsior, shavings, paper, etc., for packing will be found on the premises.

Accumulation for packing materials should consist of metal cans or a substantial wooden box and lined with metal and designed for tight closing, except in sprinkler buildings where top lid can be omitted.

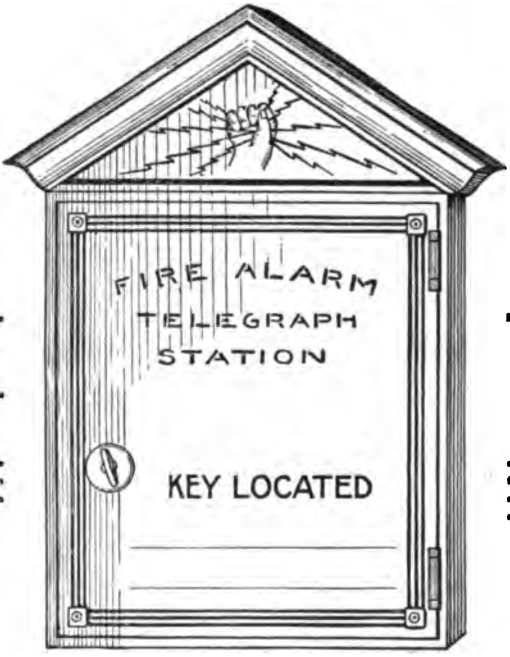
> NOTE.—A metal barrel with loosely fitting cover, the latter specifically loose so that slight battering will not cause the cover to bind, thereby resulting in its not being used.

18.—The applying of one of the four terms as to general condition of the entire property inspected will be based upon the judgment of the inspector, and after completing his work if the term "bad" is used, the property will invariably be inspected by an expert who will

DO NOT REMOVE

KEEP THIS CARD BEFORE YOU!

NEAREST FIRE ALARM BOX



How to send in an alarm of fire over the

KEYSTONE PHONE

CALL "ELECTRICAL BUREAU"

When male operator at Electrical Bureau answers

SAY "FIRE"

and give the exact location. Should the fire be on a small or not well-known street also give the names of the main streets nearest the location.

How to send in an alarm of fire over the

BELL PHONE

CALL "SPRUCE 20"

When male operator at Spruce 20 answers

SAY "FIRE"

and give the exact location. Should the fire be on a small or not well-known street also give the names of the main streets nearest the location.

THIS BOX IS LOCATED

HOW TO SEND IN AN ALARM OF FIRE

Turn key handle to right, open door, pull hook down all the way ONCE; then let go; close the door and wait for the Apparatus to arrive and then direct Firemen where to go. The mere opening of the door does not send in the alarm.

FURTHER DIRECTIONS

In case of fire send some one immediately to THIS BOX to give the alarm or use either phone (see instructions above). Telephone service free on either phone for sending fire alarm. Be sure to tell Central that it is a FIRE CALL. Do not DELAY in sending in the alarm.

After sending in the alarm, and pending the arrival of the firemen, use every means in your power and all facilities to check the progress of the flames. The firemen will do the rest.

By Direction,

Geo. D. Porter.

DIRECTOR, DEPARTMENT OF PUBLIC SAFETY

PREVENTION OF FALSE ALARMS

So as to send alarms quickly, a key (protected by a glass cover) is being installed on each box, though this facilitates sending false alarms. Help prevent this by questioning any one seen at the box and reporting description and address to Electrical Bureau.

POSTED BY FIRE MARSHAL **PHILADELPHIA**

be selected from a corps containing specialists in different lines.; in fact, the best men on each general improvements as are outlined by the first inspector.

19 and 20.—Access to a basement may be by way of the yard or areaways, and the former is the natural gathering place for boxes and old lumber for possible future use. The areaways permit by gravity this accumulation of rubbish, sometimes inflammable, and being below the sidewalk a lighted cigar stump or other means of easily starting fire may find its way there and start a fire, which will of course enter the building through unprotected windows and frames. The inspector will appreciate the need of cleanliness in these sections, and is instructed to recommend where locks are used the prominent placing of key and the frequent opening and closing of all entrances.

21.—It is important to note in what proximity to the fire the ashes are stored—this since the ash heap usually receives the general dumping of inflammable materials from all parts of the building. The quantity is of interest from the standpoint of cleanliness and the possibility of the pile while starting remote from any danger growing toward a furnace or other means from which it may be lighted. It is of course good practice to pile ashes only on non-inflammable floors, since they are sometimes removed while heated. In many places they are stored directly from the boiler or furnace into the receptacle in which they are removed, and the receptacles under such conditions should be metal.

NOTE.—Keep ashes and rubbish from proximity of gas meter.

22.—Good practice dictates the presence of at least two feet clearance between the top of a boiler or furnace and the woodwork above, and where possible at least this clearance from all surrounding woodwork should be preserved. A steam boiler encased in brick or asbestos is made quite safe by this means, and an ordinary hot-air furnace can frequently have the top filled with sand to reduce heat radiation, thereby decreasing fire danger.

FLUES

The question of clearance of flues from ceiling or woodwork and the protection provided has bearing here on that portion of the metal pipe leading from the back of boilers or furnaces to the chimney. This pipe should be substantially supported. Because of the gases present this pipe is frequently eaten out and should be carefully observed as to its condition; where it runs in close proximity to woodwork, and this condition cannot be avoided, special provision should be made for the placing of non-conducting and non-inflammable protection around the exposed woodwork. A metal baffleplate lining between wood and smoke pipe and free of each is an effective preventive of fire danger.

23.—Good practice dictates that a chimney should be at least two feet above the roof. Owing to the exposure of this piece of work it frequently becomes dilapidated, the condition of which the owner is often entirely ignorant. Chimney defects can usually be remedied by repointing at small expense, and the inspector is instructed to call attention to such needed improvement.

It is a not infrequent practice of paperhangers to paper over chimney openings after closing the pipe holes with rags, etc., or by providing a backing for their paper by pasting muslin over the pipe hole. Special attention should be given where coal stoves are or have been used to learn of all openings and investigate their condition.

It is good practice to have at least 3 inches clearance between the joist and the sides of the chimney. This can easily be noted in the basement where joists are exposed. Where there has been a violation of this practice and a request is made to improve conditions, either by providing insulating materials or trimming away the joist, the order should be extended to the other stories of the building, which may not be in evidence, but can be determined by sounding.

It is suggested that the inspector inquire relative to the clearing of chimney and flue pipes of soot, which should be done at least once yearly.

24.—Under and back of radiators is the natural place for the accumulation of dust and rubbish, and steam radiators or coils are frequently the resting place of rags, waste, etc., all of which creates a hazard, and these should be ordered cleared and the rubbish removed. Where steam pipes come in contact with wood it is an established fact that fire will result after a certain period. Careful consideration should be given to the use of thimbles or sleeves around pipes that pass through woodwork.

25.—All gas stoves should be placed under conditions that the woodwork within 6 inches be protected by metal face and rubber hose connections entirely avoided — that is, solid iron pipe attachment should be used. Where gas-heated irons are used proper metal stands raising iron 3 inches above table and at a distance from all inflammable material should be provided, and flexible metal hose used instead of rubber hose.

26.—The best practice in the installation of coal ranges is to have them entirely surrounded by non-inflammable walls, and a base of similar materials one foot larger than the base of the range on open sides. Careful inspection should be made of the support for this base, as in some buildings it is found extremely weak, and has permitted the range in slight fires to sink into the basement. Plaster walls about a range do not always indicate non-inflammable conditions. These should be very carefully examined to note that they are not on lath and studding.

The ordinary heating stove should always be mounted a substantial distance above the floor with a metallic base and a smoke pipe substantially hung and properly entered into the chimney. Where the smoke pipe passes through partitions of any character it should be protected with a terra-cotta thimble.

27.—Owing to the comparative newness of electricity for general commercial and domestic purposes, rapid strides mark improvements from a fire standpoint each year. Old installations invariably embody what the present-day knowledge declares a fire hazard. Open wiring, certain nature of occupancy, loose wires, poor insulation and many defects that are noticeable on a superficial examination should be reported upon by the inspector.

It is also generally understood that combustible materials should not be placed in contact with lamps, which danger is constantly overlooked in the trimming of windows and the creating of effects at festival seasons.

28.—Gas fixtures of swinging design that will permit of the flame being thoughtlessly brought in contact with or close to woodwork or other materials should either be replaced with a stationary fixture or provided with a large cage guard, restricting the relative position of the flame and the inflammable material.

It has been noted that lava gas tips of the kind that are easily removed from the brass collar are sometimes lost or loosened by gas pressure, and when removed allow the flame to shoot high in the air, thereby creating danger that is entirely eliminated while the jet is in good working order. The United Gas Improvement Company provides free of charge a tip that entirely eliminates this danger. Where such dangerous conditions as above described are noticeable, this U. G. I. type of tip and source of supply should be recommended.

When the woodwork above a gas light is within two feet of the flame, a substantial sized non-inflammable plate should be provided.

29.—Smoking in buildings of any character should be governed by common sense. In many States there are laws forbidding smoking. Conditions of such premises visited, also an opinion where smoking is permitted regarding the continuance of the practice, and where in the judgment of the inspector it should be discontinued, with his reasons for this decision, to be furnished.

30 and 31.—There exist at present laws governing the having, using, keeping and storing of the dangerous materials as described in the form, and the inspector is instructed to very carefully secure correct data in answer to the questions on the form, so that the examining corps can determine if violations exist.

Note.—Ordinance April 2, 1901, pages 29-55 attached, governs these materials.

32 and 33.—Here, as with the remarks on dangerous materials, there are laws governing the proper installation and maintenance of exits and fire escapes. For reasons previously stated, correct data in answer to the questions under these headings should be given for the consideration of the examining corps.

34.—The style of fire pails recommended by the insurance interests is the flat or round bottom, substantially built of sheet steel with a tight cover, galvanized and painted. These pails should be reserved for fire use only, should be plainly stenciled, and always located where accessible. Covers on pails are not essential as contents must be noted; pails should always be filled to capacity.

35.—There are many different makes of chemical extinguishers on the market, and the majority approved by the underwriters. One of the most common types is the 3-gallon extinguisher, which must be inverted to operate. These chemical extinguishers should be recharged and tagged with the date at least once yearly, and the inspectors are instructed to report the date of the last charging; also to make inquiry to ascertain whether the occupants of the building inspected understand the proper operation of the extinguisher.

36—The standpipe to which inside hose is attached is installed according to the building conditions—that is, where the building is heated and a tank provided as a source of supply, water will be found in the standpipe up to the hose valve; whereas, in an unheated building with no tank the standpipe will be dry and the water supply obtained by connecting the fire engine to the siamese steamer connection, which is usually placed prominently on the front of the building.

An inspector's experience as a fireman will permit him to determine the condition of the hose; also if it is properly racked for quick use without entanglement or unnecessary kinks; also if the nozzle is not only in place but that the thread of the nozzle and the thread of the hose coupling, also the hose valve, are companions and fit each other properly.

NOTE.—Where fire department size hose is used, fire department style of coupling, Jones, is preferred.

37—This subject is very broad in its proper application to buildings of varying construction and occupancy. The questions to be answered on the form are comparatively simple, but the inspector is advised to become conversant with automatic sprinkler protection by reading the numerous publications on this subject. A pamphlet issued by the underwriters is free on application. It gives the fundamentals of an automatic sprinkler system.

38—Steamer connections for the purpose of discharging water under pressure from the engine to inside hose or automatic sprinkler systems are usually placed in a prominent position and with correct type of coupling for the quick applying of the department hose. Ignorant or unscrupulous contractors occasionally place steamer connections under conditions that make their use impossible, and it is also noted in some sections of the city these steamer connections are destroyed by malicious persons desiring to steal some of the brass parts. The conditions justify careful inspection. It should also be specially noted that the plate above the steamer connections properly designates it use, for it has occurred that steamer connections for various purposes have been improperly designated by the name-plate attached. There are three kinds of steamer connections in use in our city, i. e.—1. Single steamer connections, ready to receive 2½-in. hose; 2. Siamese or twin-head steamer connections for two lines of 2½-in. hose; 3. Combination connections having two outlets for 2½-in. hose above described under 2, and also a 3½-in. outlet for the attaching of hose from high pressure system.

NOTE.—In these the inspector should find, by removing cap, a flapper which will permit the use of only one of these two outlets without blowing the pressure into the street through the other outlet.

NOTE.—The inspector should study the arrangement of flappers in these combination connections, for the only proper design is the arrangement whereby any one of the three outlets can be used and pressure placed direct in system without loss through the unused outlet.

General Form Used by Fire Prevention Inspectors

BLOCK.. Form 301 10-13 25M

..............................*Inspection.*

DEPARTMENT OF PUBLIC SAFETY

PHILADELPHIA FIRE PREVENTION COMMISSION

CITY HALL

FIRE DEPARTMENT INSPECTION

....191.........

1 Name of Inspector..Co. No..................
2 Location of Building..
3 Owner or Lessee of Building..
4 Address ....
5 Name of Occupant and Use of Each Floor:
....
6 Main Cut-off: Electricity..
7 Main Cut-off: Water..
8 Main Cut-off: Gas..
9 Nearest Fire Hydrant..Next Nearest..
10 No. and Location Nearest Fire Alarm Box..

ACCESSIBILITY

11 From how many sides can building be reached?..
12 Basement—How many points?..Where?..
Is Basement sufficiently accessible?..

CLEANLINESS

BUILDING:
13 Examined basement, all floors and roof?..
14 Examined elevator wells, under stairs and benches, in lockers, cupboards, etc.?
15 Any oily waste, rags, refuse, sweepings, excelsior, shavings, papers, etc.?.........
16 Are more waste cans or metal refuse barrels needed?..
17 Packing material—Kind: ....How much?..
Where stored?..In what?..
18 Conditions as a whole: Excellent..................Good..................Fair..................Bad.............
YARDS, ETC.:
19 Yards and area free from refuse, etc.?..
20 Areas to basement windows clear?..................How often cleared out?..................

HEAT HAZARDS

21 ASHES:
Where stored? ....Quantity?..
In or on what?..Removed in what?..
22 BOILERS AND FURNACES:
How close to woodwork?..
Distance of flues from ceiling or woodwork; and protection?..
....
23 CHIMNEYS:
How far above roof?..Condition?..
Holes not properly closed?..
Joists properly trimmed away?..
24 RADIATORS AND STEAM PIPES:
Clear of all combustible material?..
25 GAS STOVES:
Near woodwork?..Metal protection sufficient?..
Iron Pipe—no hose—connection?..........................Any gas heated sad irons?..................
How protected?..Metal stands when not in use?..................
26 COAL STOVES:
If range, how set?..
Floor protection for ordinary stove?..
Sufficient clearance rear and sides?..
Additional protection needed?..

LIGHTING

27 ELECTRIC:
General condition of wiring: Good..........Fair..........Bad..........
Lamps against combustible materials?..........
Heaters and irons provided with separate fuses, switches and pilot lights?..........
....
Electric irons?..........Metal stands when not in use?..........

28 GAS:
Swinging jets near woodwork?..........
Open lights near combustibles?..........
Guards needed around lights?..........
Protection needed over lights?..........

SMOKING

29 Allowed at all?..........Where?..........
Should it be forbidden?..........Where?..........
Signs plentifully posted?..........Rule enforced?..........

DANGEROUS MATERIALS

30 GASOLINE, BENZINE, ETC.:
Where stored?..........How much?..........
Used for what?..........Care exercised?..........
Fires or lights near?..........

31 CHEMICALS, ETC.:
Any powder, fireworks, volatile oils, paints, acids, highly inflammable materials, etc.? ....
Where stored?..........How much?..........
Used for what?..........

EGRESS

32 EXITS:
How many elevators?..........Stairs?..........Fire wall openings?..........
Kept clear?..........Sufficient light?..........
Do exit doors swing with travel?..........

33 FIRE ESCAPES:
How many..........Width of each..........
Lower section—how dropped..........
Reach all portions of building..........
Firmly supported..........Good repair..........
Painted ....Obstructed..........

FIRE EXTINGUISHING APPARATUS

34 PAILS:
Number each floor..........Enough (3 per 1000 sq. ft.)..........
Full ....Accessible ....

35 CHEMICAL EXTINGUISHERS:
Number each floor..........Properly charged..........
Accessible ....Operation understood..........

36 INSIDE HOSE:
Water on..........Good condition..........
Properly racked..........Nozzle in place..........

37 AUTOMATIC SPRINKLERS:
Protecting what part of building..........
Location of main stop valve..........

38 STEAMER CONNECTIONS:
Location..........
Kind and condition..........
Purpose..........Has name plate..........

It is desirable in making recommendations for the eliminating of fire menaces to have all inspectors use a uniform statement where intended to cover like conditions. To this we quote below phrases which cover a large part of the usual recommendations used by our inspectors, with instructions, so far as possible, not to deviate therefrom either on your report or recommendation sheet.

RECOMMENDATIONS

Protect exposed woodwork under gas stoves with sheet metal, leaving 1-inch air space between metal and wood, or in lieu thereof provide all-metal stand (this does not mean gas ranges).

Provide sheet metal covering on woodwork around gas or coal stoves, leaving 1-inch space between metal and wood.

Provide metal flexible hose instead of rubber hose.

Provide metal protection under coal stove.

Provide metal barrel with loose-fitting cover for waste paper, refuse, etc.

Provide metal can for ashes.

Provide safety can for gasoline, oils, etc.

Provide self-closing cans for oily rags and waste.

Provide metal shield suspended over smoke pipe with at least 3 inches of space above and below this shield; in lieu thereof, smoke pipe to be at least 2 feet below the joist or ceiling.

Provide stationary in lieu of swinging gas jets, or provide wire guards for swinging ones.

Provide sheet metal over and around gas jets, leaving 1-inch air space between metal and wood.

Provide sheet metal lining for under side of elevator doors.

Post at least — "No Smoking" signs (furnished free on application at Room 388, City Hall), on ——— floors.

A 2-foot exit or aisle space must be maintained at all times on ——— floors.

Recharge chemical extinguishers and tag with dates.

Refill fire pails.

Install — fire pails (*AND ALWAYS KEEP SAME FILLED WITH CLEAN WATER*) on ——— floors.

Provide metal protection over flue holes.

Repair or point chimney above roof.

Repair, brush and paint fire escapes.

NOTE.—All recommendations for new fire escapes or repairs to present escapes must always be put on back of inspection blanks as well as the filling out of separate form.

Place block number and block letter on every report.

Always notify this office when changing your day off.

Always notify this office through your commanding officer when you have had a service fire which will prevent your reporting on inspection work the next day.

Instead of marking the word *SPECIAL* on inspection reports for items requiring immediate attention, attach a memorandum to inspection report.

Inspectors must turn in their reports daily to their commanding officers so they can be forwarded to this office through the various channels.

Inspectors when sent to work in another company's district will be sure to mark their own company number and also the company number of the district in which they work on reports.

Inspector upon leaving the station will enter in log book where he is going to start to work and the direction in which he will be working.

Be sure to have correct date on inspection reports and on requirements slips left at property.

State positively the number of cans, fire pails, chemical extinguishers, etc., to be installed on each floor, the number of fire pails to be refilled, the number of flue holes to be closed, etc.

SPECIAL NOTICE

Attention has been directed by the Electrical Bureau to a practice of some city employees using the emergency wire (Spruce 20) to communicate from points outside with this office. You are no doubt aware that this service (Spruce 20) is granted without charge to the city by a corporation for *fire and extreme cases of needed police protection,* and under no circumstances must it be used for any other purpose.

You will please accept this as a notice to discontinue using this call for any other than its intended purpose, as above set forth, with the understanding that a penalty will be imposed for noncompliance.

FIRE RECORD

FOR

FIRE MARSHAL BY BUREAU OF FIRE

Form 314 11-13 5M

No.

Entered at F. M. office

DATE

LOCATION

BUILDING

Stories Brick, frame, etc.

OTHER THAN BUILDINGS

Trolleys, Autos, Fences, Dumps, Vacant Lots, etc.

BUSINESS

OWNER

ADDRESS

LOSS

On Building On Contents

INSURANCE

On Building On Contents

VALUE

On Buildings Involved On Contents Involved

KILLED INJURED

TENANTS

Name Floor

ORIGIN OF FIRE

FIRE CONFINED TO

Floor of Building

FIRE SPREAD TO

Floor of Building

PERSONS INTERVIEWED AND THEIR REMARKS:

OTHER INTERESTED PERSONS PRESENT

YOUR GENERAL CONCLUSION

REPORT MADE BY

Name of Captain

COMPANY No.

CHECKED AND FORWARDED

Battalion Chief.

EXHIBIT 5

REPORT OF NUISANCES BY FIRE PREVENTION INSPECTORS

Of the Bureau of Fire to the Division of Sanitation, Department of Health and Charities

COÖPERATION—EFFICIENCY

In performing the inspection service for reducing fire hazard in properties, our inspectors will find many by-products of their effort not directly applicable to this subject.

Unsanitary conditions, for instance, in most cases can not be classed as fire hazards but are prejudicial to public health for which we all are directly or indirectly responsible as employees of our citizens. The attached form, with following explanation of use, is to be studied and when such conditions are revealed during your fire inspection work a report on this form is to be made and turned in with your regular fire report.

Below will be found (see attached form) in the order of their listing an explanation of what each of the nuisances named might consist. This is given in order that the inspectors may more intelligently report thereon.

1—In the upper right hand corner a blank space is left for the date on which the inspection is made.

2, 3, 4—Blank lines, one for the address of the property inspected, and the others for the name and address of the owner or agent.

5—At the left of this tabulation is a blank column under word check 5 which is intended for the insertion of a check mark opposite the nuisance which the inspector finds on the premises.

6, 7—Defective paving in yard (and defective paving in alley).

By this is meant a pavement that is worn out, full of holes, badly cracked or disintegrated, and which is likely to hold surface drainage water or permitted to seep into the adjacent cellars or basements. This does not mean an alley or yard that simply has a crack in the pavement or minor defects. This nuisance should also include any ungraded and unpaved yards and alleys where surface water collects.

8-14—To be reported on sanitation report where detrimental to health.

15—Manure pits. This means an exposed accumulation of manure in a depression or wooden bin, without cover or screens.

16—Manure piles. This means the ordinary accumulation of manure generally found in and around stables, which is usually exposed to the elements and accessible to flies and other insects and is generally unsanitary and a nuisance in the community.

17—Self-explanatory.

18—Privy wells on sewered streets. All premises adjacent to streets containing sewers must by law connect with this sewer and abandon any privy wells or cesspools on their property. The inspector can tell whether there is a sewer in the street by the presence of vent boxes near the curb line, sewer manholes, or sewer inlets.

19—Surface drainage to yard.

20—Surface drainage to private alley. By this is meant an accumulation of filth or stagnant water. This might be caused by rainfall, or the dumping of wash water in the yard, or the emptying of sink drain into the yard, etc.

21-24 (inclusive)—Self-explanatory.

25—Leaking of obstructed drains. By this is meant drain pipes leading to the sewer or private drains and alleys which have become clogged up, and an accumulation of sewage and filthy water is caused which prevents the use of the necessary plumbing fixtures.

26—Leaky roof. This is a roof through which the water comes in sufficient quantity to cause dampness and exposes the tenants.

27—Keeping animals in house or cellar. By this is meant the keeping of any domestic animals inside any portion of the house. This applies to dogs and cats, as well as other animals.

28—Self-explanatory.

29—Water supply insufficient. By this is meant that in every dwelling and every apartment of two or more rooms there must be a water supply if there is a water main in the street. If the apartment consists of one room, there shall be at least one source of water supply in an accessible place for every two such apartments; in all rooming houses there shall be a full accessible water supply on every floor, with the exception of instances where there are less than three rooms to each floor, and in that case a full, accessible water supply shall be introduced on alternate floors.

30—Miscellaneous or remarks (at bottom of the sheet). Under this heading any other nuisances or information upon which the inspector desires to report can be noted. He must sign his name and company number at the bottom of the sheet, turning in the report to the captain of his company with other daily fire prevention reports for forwarding to headquarters.

Form Used by Fire Prevention Inspectors to Report Nuisances to Division of Sanitation, Department of Health and Charities

1 1913

Division of Sanitation, Room 615, City Hall.

Attention is called to conditions at

2 .... (address)

3 ....(agent or owner)

4 .... (address)

5 Check NUISANCES
6 Defective paving in yard
7 Defective paving in private alley
8 Filth or refuse in house
9 Filth or refuse in stable
10 Filth or refuse in other buildings
11 Filth or refuse in cellar
12 Filth or refuse in yard
13 Filth or refuse in private alley
14 Filth or refuse in vacant lot
15 Manure pits
16 Manure piles
17 Privy wells, full or overflowing
18 Privy wells on sewered streets
19 Surface drainage in yard
20 Surface drainage in private alley
21 Water closets broken
22 Water closets obstructed
23 Water closets without water supply
24 Foul odors of any kind
25 Leaky or obstructed drains
26 Leaky roof
27 Keeping animals in cellar or house
28 Water in cellar
29 Water supply insufficient
30 MISCELLANEOUS OR REMARKS

Name of Inspector.................., Co. No.......

Place check-mark against the item reported.

APPENDIX 4

"CLEAN-UP" WEEK AND "FIRE PREVENTION" DAY

Appeal of the Philadelphia Fire Marshal for a Strict Observance of "Clean-Up Week," April 20-25, 1914.

Authorities agree that thoughtless, careless and uncleanly housekeeping accounts for more than half of all fires.

Last year our city suffered a fire waste in excess of $2,000,000, which, added to the expense of the fire department and the cost of insurance above the amount returned, makes a per capita tribute to uncontrolled fire above $5.00 for every man, woman and child.

HELP TO REDUCE THIS TAX BY CLEANING UP!

With the growth of our city the cost of insurance and the maintenance of the fire department will inevitably increase unless the fire waste is abated.

"Clean-up Week" affords an admirable opportunity to attack fire causes, or the combinations of conditions that contribute heavily to the number of fires, as instanced by the following extracts concerning the 3651 fires of 1913, which represented an average loss above $600 per fire:—

"ALL PHILADELPHIA CLEAN-UP WEEK"
APRIL 20TH TO 25TH
Clean your cellars, yards, alleys and closets. Rid them of all rubbish.
WHITEWASH ALL YOU CAN
YOU WILL HAVE
FEWER FIRES
BETTER HEALTH
A CLEANER CITY
All Hands To The Broom And Help
ALL PHILADELPHIA
CLEAN UP WEEK
APRIL 20th to 25th
FEWER FIRES
BETTER HEALTH
A CLEANER CITY
GET BUSY!
Clean up for a SPICK and SPAN PHILADELPHIA
2nd ANNUAL ALL PHILADELPHIA
CLEAN UP WEEK
APRIL 20th TO 25th
1914
PHILADELPHIA EVERYBODY HELP
MAKE OUR CITY BRIGHTER
APRIL 20th TO 25th CLEANING UP DAYS
GET RID OF RUBBISH IN YOUR HOUSE-CELLAR & YARD
EVERYBODY DOING THE SAME THING — WAGONS WILL CARRY AWAY ALL RUBBISH EVERY DAY-FREE OF CHARGE
A General Clean-up 5 DAYS Everybody Help

FOUR TYPICAL "CLEAN-UP" SIGNS

55 fires caused by ashes carelessly stored
45 " " " combustible material stored around heaters
807 " " " careless handling of matches
56 " " " rubbish improperly kept
23 " " " fire communicating from open fireplaces
25 " " " careless use of benzine, gasoline, etc.
108 " " " careless use of candles in closets
126 " " " gas jets in contact with lace curtains

No matter what line of effort is followed to join in the "Clean-up Week," nothing can excel the good results in the absolute SAVING OF LIFE AND PROPERTY by the removal of causes and conditions which come from lack of cleanliness, neglect and lack of care and order, namely:

The accumulation of rubbish and combustible materials anywhere.

Gathering of dirt and useless goods in cellars and basements.

Criminal carelessness in storing combustible material around heaters and stoves.

Hanging clothing carelessly in closets and examining the same with matches or candles.

Keeping combustible material in wooden receptacles, when a metal holder would preclude danger.

Keeping matches in tin boxes or dishes and out of the reach of children, a flagrant evil with many ills.

Keeping exposed in yards, upon roofs and other exposed locations, wood and inflammable material, which a spark may set on fire.

Allowing loose paper, rags and other incidental material around fireboards and in stovepipe holes.

Committees have been formed and are now actively at work on—Finance; The Press; Posters and Printed Matter; Theater and Moving Picture Notices; Street Car Notices; Trade Associations; Community Associations; Charitable and Benevolent Associations; Schools and School Children; Churches and Retail Stores—for publicity; Care for Vacant Lots; and Fire Prevention. Active and concerted work by all of these agencies must result in a cleaner, purer, healthier and safer city.

J. S. Mallory
Fire Marshal

Note.—Hundreds of American cities are holding "Clean-up" weeks this Spring; and 33 States now have formal "Fire Prevention" days annually. Such clean-ups are highly beneficial for health as well as fire control in Spring after the Winter, and are most appropriate during the last 10 days in April; while in the Fall—preferably during first 10 days of October—they help the fire hazard particularly by inducing repair and cleanliness in the flues and heating apparatus before fires are started for the Winter.—Ed.

APPENDIX 5

Following is the Pennsylvania State Fire Marshal law. The notes were added from Mr. Evans's pamphlet urging and explaining this law prior to its enactment.

AN ACT

No. 254.

Establishing the office of State Fire Marshal; defining his powers and duties; providing for his compensation, and the maintenance of his office; giving courts the power to punish witnesses for contempt of his authority, and to review his orders; and making it the duty of officers of public instruction and persons in charge of public or private schools to instruct children as to the dangers of fire and the prevention of fire waste.

Section 1. Be it enacted, &c., That the Governor of the Commonwealth shall, within thirty days after the approval of this act, appoint a State Fire Marshal, who shall hold office for a term of four years, or until his successor is appointed and qualified. The State Fire Marshal shall be a citizen of the Commonwealth of Pennsylvania, shall keep his office in the capitol at Harrisburg, and shall devote his entire time to the duties of his office. He shall receive an annual salary of five thousand (5,000) dollars, and in addition shall be paid his actual and necessary expenses incurred in the performance of the duties of his office. He shall give bond, in the sum of ten thousand (10,000) dollars, for the faithful performance of his duties.

Section 2. The State Fire Marshal shall appoint a chief assistant fire marshal, who shall receive an annual salary of four thousand (4,000) dollars; and a first and second deputy fire marshal, each of whom shall receive an annual salary of three thousand (3,000 dollars. Each such assistant and deputy shall also be paid his actual and necessary expenses incurred in the performance of the duties of his office. The State Fire Marshal shall also appoint one or more stenographers, at an annual salary not to exceed one thousand two hundred (1,200) dollars each; and such other clerks and assistants as may be needed, at a cost of not exceeding three (3) dollars per day each. In case of the absence of the State Fire Marshal, or his inability, for any cause, to discharge the duties of his office, such duties shall devolve upon the chief assistant fire marshal. In case of the absence or inability, for any cause, of both the State Fire Marshal and chief assistant fire marshal, their duties and powers shall devolve upon the first deputy, and, failing him, upon the second deputy.

Section 3. The chief of the fire department in any county, city, borough, township, school district, or other municipality or incorporated district, where such fire department is established, or, where no such

NOTE.—Authorities all over the country agree that firemen, active and retired, should, as far as possible, inspect the properties they protect, both to know them in case of fire and to prevent in advance conditions which lead to fire. Their duties in this respect are limited by proviso at end of Section No. 4 following. As fireman cannot cover all the inspection work, the fire marshal can appoint others at his discretion as assistants.

fire department exists, the burgess of any borough, or president or chairman of the board of supervisors of any township or other municipality or incorporated district, shall be, by virtue of such office held by them, assistants to the State Fire Marshal, and subject to the duties and obligations imposed by this act, and subject to the directions of the State Fire Marshal in the execution of the provisions hereof. The State Fire Marshal may also appoint individual citizens as assistants, who shall be subject to the duties and obligations aforesaid, and to the directions of the State Fire Marshal. Immediately upon taking office, the State Fire Marshal shall prepare instructions to the assistant fire marshals, and forms for their use in the reports required by this act, and shall cause them to be printed and sent, together with a copy of this law, to each such officer in the Commonwealth.

NOTE.—Defines duties of assistants (under central officers) substantially as adopted in New York act. Sections 4 to 7 inclusive tend to materially reduce the opportunity for the crime of arson as shown in Ohio and Wisconsin.

Section 4. The assistants of the State Fire Marshal shall investigate the cause, origin, and circumstances of every fire occurring in this State, by which life or property has been destroyed, damaged, or endangered, and so far as possible shall determine whether the fire was the result of design or carelessness. Such investigation shall be begun immediately upon the occurrence of the fire, by the assistant in whose territory it has occurred, and if it appears to the assistant making such investigation to be of suspicious origin the State Fire Marshal shall be immediately notified of such fact. Every fire occurring in this State shall be reported in writing to the State Fire Marshal, within ten days after its occurrence, by the assistant in whose jurisdiction it occurred. Such report shall be in the form prescribed by the State Fire Marshal, and shall contain a statement of all facts relating to the cause and origin of such fire that can be ascertained, the extent of damage thereof, the insurance upon the property injured or destroyed, and such other information as may be required: Provided, however, That the duties to be performed by the assistant fire marshals, or any of them, may be limited by the State Fire Marshal so as to reasonably accord with their preexisting public duties.

NOTE.—Defines duties, powers, penalties, and processes vested in fire marshal organization to accord with Pennsylvania law, and to provide authority incorporated in New York act.

Section 5. The State Fire Marshal, his deputies or assistants, upon the complaint of any person, or whenever he or they shall deem it necessary, shall inspect the buildings and premises within their jurisdiction. Whenever any of the said officers shall find any building or structure which, for want of repairs, or by reason of age or dilapidated condition, or for any other cause, is especially liable to fire and so situated as to endanger other property, he or they shall order the same to be removed or remedied, if the same is reasonably practicable, thereby lessening the danger from fire. Whenever such officer shall find in any building combustible or explosive matter or inflammable conditions which are in violation of any law or ordinance applicable thereto, or are dangerous to the safety of such buildings, thereby endangering other property, he or they shall order the same to be removed or remedied, and such order shall forthwith be complied with by the owner or occupant of such premises or building. If such order is made by a deputy or assistant of the State Fire Marshal, such owner or occupant may, within five days, appeal to the State Fire Marshal, who shall within ten days review such order and file his decision thereon; and unless by his authority the order is revoked or modified, it shall remain in full force and be obeyed by such owner or occupant: Provided, however, That any such owner or occupant, who feels himself aggrieved by such order, may, within five days after the same has been affirmed by the State Fire Marshal, file his petition with the court of common pleas of the proper county, praying a review of such order; and it shall be the duty of the court to hear the same at the first convenient day, and to make such order in the premises as right and justice may require.

Any owner or occupant failing to comply with such order within ten days after said appeal shall have been determined, or, if no appeal is taken, then within twenty days after the service of said order, shall be liable to a penalty of twenty-five dollars for each day's neglect thereafter. The service of any such order shall be made upon the occupant of the premises to whom it is directed, by either delivering a true copy of same to such occupant personally, or by delivering the same to and leaving it with any person in charge of the premises, or, in case no such person is found upon the premises, by affixing a copy thereof in a conspicuous place on the door to the entrance of the said premises. Whenever it may be necessary to serve such an order upon the owner of premises, such order may be recovered as debts are by law collectible, in any courts having a true copy of the said order, or, if such owner is absent from the jurisdiction of the officer making the order, by mailing such copy to the owner's last known post-office address. The penalties herein provided may be recovered as debts are by law collectible, in any courts having jurisdiction of the parties. Such action shall be brought in the name of the Commonwealth, under the direction of the State Fire Marshal or any of his deputies or assistants, by the Attorney General, or by any district attorney or legally constituted law officer of any county, city, borough, township, or other municipality, who may be designated by the Attorney General; or at the option of the Attorney General, he may designate any attorney to bring such action.

NOTE.—Defines powers to obtain evidence—essential. In accord with Pennsylvania practice.

Section 6. The State Fire Marshal or his deputies, in addition to the investigation made by any of the assistants, may at any time investigate the origin or circumstances of any fire occurring in this Commonwealth. The State Fire Marshal, his deputies and assistants, shall have the power to summon witnesses, and compel them to attend before them, or either of them, to testify in relation to any matter which is by the provisions of this act a subject of inquiry and investigation; and may require the production of any books, papers, or documents deemed pertinent or necessary to the inquiry; and shall have the power to administer oaths and affirmations to any person appearing as a witness before them; such examination may be public or private, as the officers conducting the investigation may determine.

No person shall be excused from attending before the said Fire Marshal, or any of his deputies or assistants, when summoned so to attend; nor, when ordered so to do, shall be excused from testifying, or producing any books, papers, or documents before such officer, upon any investigation, proceeding, or inquiry instituted under the provisions of this act; upon the ground or for the reason that the testimony or the evidence, documentary or otherwise, required of him, may tend to convict him of a crime or subject him to a penalty or forfeiture; but no person shall be prosecuted, or subjected to a penalty or forfeiture; for or on account of any transaction, matter, or thing concerning which he may have been required so to testify or produce evidence, documentary or otherwise; and no testimony, so given or produced, shall be received against him upon any criminal investigation or proceeding. If after any such examination the State Fire Marshal, or any of his deputies or assistants, is of the opinion that the facts in relation to such fire indicate that a crime has been committed, he shall present the testimony taken on such examination, together with any other data in his possession, to the district attorney of the proper county, with the request that he institute such criminal proceedings as such testimony or data may warrant.

The State Fire Marshal, or his deputies or his assistants, may, at all reasonable hours, enter any building or premises within his or their jurisdiction, for the purpose of making an inspection, which, under the provisions of this act, he or they may deem necessary to be made.

NOTE.—Defines penalties for recalcitrant witnesses—essential. In accord with Pennsylvania practice.

Section 7. Any witness who refuses to obey a summons of the State Fire Marshal, his deputies or assistants; or who refuses to be sworn or to testify; or who disobeys any lawful order of the State Fire Marshal, his deputies or assistants, in relation to any investigation instituted by him or them; or who fails or refuses to produce any books, papers, or documents touching any matter under investigation or examination; or who is guilty of any contempt, after being summoned to appear before him or either of them to give testimony in relation to any matter or subject under examination or investigation as aforesaid, may be punished as for contempt of court. For this purpose, application may be made to any court within whose jurisdiction the contempt in question took place, and for which purpose the courts of common pleas of this Commonwealth are hereby given jurisdiction.

NOTE.—Provides for continuing records now practically non-existent and unobtainable—essential. Having authorized and organized a Fire Marshal force then the publicity of records obtained becomes most important as a moral check on the office, and an avenue for volunteer work.

Section 8. The State Fire Marshal shall keep in his office all records which may be sent him in accordance with law relative to the physical condition of buildings, whether the laws and ordinances have been complied with so far as the same relate to fire protection, records of application for fire insurance upon any buildings, or other information relating thereto which may be sent him in compliance with law; and shall also keep a record of all fires occurring in this State, and of all the facts concerning the same, including statistics as to the extent of such fires and the damage caused thereby, and whether such losses were covered by insurance, and, if so, in what amount. Such records shall be made daily, from the reports made to him by his assistants, under the provisions of this act. All such records shall be public, except that any testimony, taken in investigations under the provisions of this act, may be withheld from the public, in the discretion of the State Fire Marshal.

SECTION 9.

NOTE.—Provides cheap and effective notice annually to property owners with important and continuous educational value to adults through the State.

It shall be the duty of the State Fire Marshal to prepare blank forms for the furnishing of information, by owners or occupants of buildings, throughout the Commonwealth, of the condition of such buildings with regard to fire protection. The said blanks shall contain notice to such property owners or occupiers of proper rules and regulations to minimize the danger of fire and to suppress fire waste; and shall contain certain questions requesting information of a definite character, to show the condition of the buildings as aforesaid. These blank forms shall be furnished by the fire marshal to officers whose duty it is to receipt for taxes on real property, in every part of the Commonwealth, to be given by them to property owners, together with their tax bills (two forms for each property); with the requirements that one, properly filled out, be forwarded to the State Fire Marshal at once, for filing among the records of his office, and that the other be so forwarded six months thereafter.

NOTE.—Defines educational scheme for schools of present and future value, closely following well-known "Reed" law of Ohio which has been found during the past five years very workable and effective.

Section 10. It shall be the duty of the fire marshal to prepare, in consultation with the Superintendent of Public Instruction, books of instruction, for use in the public and private schools of students of all grades, with regard to the dangers of fire and the prevention of fire waste. It shall be the duty of the Superintendent of Public Instruction, and of the principals or other persons in charge of the various schools in this Commonwealth, to provide for the instruction and training of pupils of such schools by means of drills, so that they may, in sudden emergencies, be able to leave the school buildings in the shortest possible time without confusion or panic. Such drills shall be held a least once a month when the schools are in session. Books of instruction with regard to the dangers of fire and the prevention of fire waste, as above specified, shall be published at the expense of the State, under the direction of the Superintendent of Public Instruction, and shall be distributed in sufficient quantities for the use of the schools as herein provided; and the curriculum of such schools shall include some regular and continuous study of such subjects during the entire school year.

NOTE.—Requires annual reports; including preparation before the next meeting of the Legislature of a proposed "Standard Fire Insurance Policy" (most important to assure property owners a fair, sound and simple insurance contract); and a "State Building Code" for adoption by municipalities—both without added cost to the State, by men capable of sound construction of such measures, without the necessity of a cumbersome and expensive commission. Insurance is nation wide, without Federal control apparently possible. States should in the aggregate pass uniform acts to control this entire subject, as emphatically urged by the American Bar Association, through its Committee on Insurance Law, and its Allied Commission on Uniform Laws.

Section 11. The State Fire Marshal shall make an annual report to the Governor of the Commonwealth, on or before the first day of February of each year, setting forth a full report of the work of his office during the preceding calendar year, including such statistics as he may desire to include therein. He shall also recommend in his report such legislation, if any, as in his judgment may be desirable to further carry out the purpose of this law for the prevention of fire waste; such recommendation shall include a draft of an act providing for the adoption of a standard municipal building code, and a draft of an act providing for a standard fire insurance policy, for the Commonwealth of Pennsylvania, which drafts shall be reported on or before January first, one thousand nine hundred and thirteen.

Section 12. The assistants of the State Fire Marshal, not receiving a salary for the performance of public duties, shall receive, upon the audit of the State Fire Marshal, fifty cents for each report of each separate fire reported to the State Fire Marshal under this act; and, in addition thereto, shall be paid the sum of fifteen cents for each mile traveled to the place of fire; and, in the discretion of the State Fire Marshal, where an investigation has been made, a sum not to exceed three (3) dollars for each day's service spent in such investigation.

Section 13. All penalties or forfeiture collected under the provisions of this act shall be paid into the treasury of this Commonwealth.

Section 14. This act shall not be construed to repeal an act of the General Assembly, entitled "An act to provide for the appointment of a fire marshal for Allegheny County," approved the eighteenth day of April, Anno Domini one thousand eight hundred and sixty-four (Pamphlet Laws, four hundred and sixty-five). It is further hereby declared to be the true intention and meaning of this act, that the same shall not apply or be operative in any city or county of this Commonwealth where, under existing laws, whether special or general, the position and duties of a fire marshal are provided for.

Section 15. All acts or parts of acts inconsistent herewith are hereby repealed.

Approved—the 3d day of June, A. D. 1911.

John K. Tener

The foregoing is a true and correct copy of the Act of the General Assembly No. 254.

Robert McAfee
Secretary of the Commonwealth

APPENDIX 6

State Fire Prevention Association Work

NOTE.—This work must almost of necessity be organized and conducted by insurance experts because of its extremely *technical nature*. The following letter so clearly discloses its nature, scope and methods, that it is given verbatim:

Ohio State Fire Prevention Association
S. C. Neff, Secretary-Treasurer
808 New First National Bank Building
Columbus, Ohio

June 3, 1911.

MR. POWELL EVANS,
c/o Merchant & Evans,
Philadelphia, Pa.

Dear Sir:

The writer is of the impression that your name was suggested during the meeting of the National Fire Protection Association as one who would be interested in the work of forming a PENNSYLVANIA STATE FIRE PREVENTION ASSOCIATION, and I therefore take the liberty of sending you specimen copies of our work together with copy of our Constitution and By-Laws. The latter has been copied in most of the associations. You will notice particularly that we give ourselves the title, which is of great advantage, of a *State* Association.

I am forwarding you a copy of the Executive Committee's report for the past year, which will give you a general idea of the work attempted and accomplished, and I give below our method in the matter of inspections:

The Executive Committee appoints a date and town for inspection. The Chairman of the Committee calls a meeting of his committee at that town (or towns), and on their arrival a fire map of the town is borrowed from one of their local agents and placed in a general meeting room in the leading hotel. The assignments by blocks are then made to one or more individuals (members) to inspect the risks in that block and report back to the Chairman or member detailed to supervise the clerical end of the work. I should state that the meeting of the Executive Committee, as a rule, is called the day in advance of the general call for inspection in order that everything may be made ready for the work of the next day and no time lost.

After making the inspections, as per the slips (copy enclosed with data forwarded), the member writes out a "Request" notice for the owner of the risk where a defect is found and correction desired, and when all are through these inspection slips and requests are all gathered together and taken (or expressed) to the secretary who sends out the requests from the Columbus office and compiles the data for report and bulletin to the companies—all matter being gone over by the executive committee or chairman before bulletin goes out. The secretary, in the case of the Ohio association, is a lady who has her office in one of the buildings and takes care of all our correspondence, stenographic work, etc., and is also our treasurer. We felt this to be the best method in order that matters may have immediate attention at some distinct point in the State.

While the work of inspection is going on, the law and ordinance committee meet at some appointed place with the city officials and local agents and state the object of their coming, asking for assistance, and, generally getting acquaintance.

In the meantime, the chairman of the publicity committee cultivates the newspaper men, not only reporters but editors and managers, and states the reason for their coming and the aim and work of the association in a general way. We have found these publicity meetings and the work of the publicity committee to be very valuable, as it gives weight to our requests for correction.

Rubbishy conditions are the chief defects to be looked for, also defective electric wiring, rubber hose gas connections, swinging gas jets, etc., which form the main part of our requests for correction. The question of general cleanliness is the most important.

While this work of inspection is going on, the fire protection and water supply committee takes up the question of the condition in the waterworks, in connection with the proper rating bureau authorities. It is of very great importance that field men should not make a report upon deficiencies in water supplies, except with the full recommendation of the proper authorities, which matters should go to the bureau authorities. It is here we may be led into a great deal of trouble. It is not, as a rule, wise for a field man to report on the lack of or necessity for various forms of protection, for while some of them are capable to do this others are not and it is hard to draw the line. In our State we work with the engineers of the local inspection bureau and they are members of our committee on fire protection and water supplies.

We make no town reports, although some of the Western State associations have done so, but I do not think they are continuing the work. We can report deficiencies, you understand, as we see them, referring the matter for attention to some qualified and *authorized* engineer. I dwell on this matter because it is very important, and that is part of the work of the Committee on State Fire Prevention Associations of the national body to get uniformity of action. You will readily understand that a false standard recommended would only place the association in a false light, when the subject of rating would become connected with such a recommendation. We do, however, visit cities and urge them to vote on town issues to raise money to buy equipment and furnish water supplies after the proper bureau or authorities have made recommendations. We warn cities against unscrupulous contractors who may be liable to overlook the standards of requirements which would enable cities to obtain a better rating. In this way we touch on rates, but in no other fashion, as we have *nothing* to do with rates.

Certain of our members belong to the credit men's association in the several towns, and our orators—if you wish to use the expression—have been invited to address these associations and explain our work and urge coöperation. Business men's clubs, in like manner, and chambers of commerce, we have no hesitancy in addressing, and this publicity about the standards and requirements of our business and necessity of coöperation on the part of the public have led to very good results.

It is an interesting work, and we find that each man representing a company, having given his allotted time to the burden of the work, is allowed to retire and some one else come on the next year to take his place. In this division of work we find we have good results.

We heartily coöperate and are respected by the officials of the State, particularly with the office of the State Fire Marshal, Workshops and Factories, and the State Board of Health. We show them that we can be of assistance to them and we do all in our power to help the men of the State government. We invite them to our banquets, and they sit with us without any dread of there being any political issue in the matter. The results of our work have shown, in Ohio at least, a hearty coöperation from all classes of men interested in the physical welfare of the State, and this has been a matter of surprise to many of us owing to the fact that the prejudice against insurance companies has been so great that we feared little could be accomplished. It is particularly to the lowering of the loss ratio in Ohio since this work was started that we point with some pride. We feel that this work has brought about tangible results, and while it is only preliminary to better things, it is a stepping stone at least to organized effort and will ultimately educate the public to help themselves.

We admit anyone, union, non-union, mutual, or any citizen of the State to membership. We have local agents, and special agents, of all classes, and as a rule we feel that this has not been detrimental to the best interests of the business.

It is rather difficult by letter to show you what we have done, but we will be glad to answer any questions or be of any assistance to you that may be in our power, and trusting the foregoing information may be of some value to you, beg to remain

Very truly yours,

WM. B. GODWIN
Chairman N. F. P. A. Committee on
State Fire Prevention Associations

APPENDIX 7

Notes Concerning Fire Prevention in Germany, 1913 (Courtesy of Canadian Manufacturers' Association, Toronto)

In addition to their strictly professional duties, fire brigade officers are required to make tours of inspection looking to the enforcement of the fire police regulations, which concern principally building construction. Regular inspections are made of all buildings and especially factories, theaters, public assembly halls, department stores, show windows, lighting apparatus, storehouses, cellars for spirits, minerals, oils and explosives, and plants that are particularly liable to outbreaks of fire.

Undoubtedly many of these rules are in force in other parts of the world, but it is possible that something new may be found in the following. The inspectors must be well informed with respect to the fire police regulations. The great increase of late in the number of electrically-operated plants has necessitated particular attention in training inspectors in order that they may be equal to the demands of public safety. Some features of their work are:

In *theaters* only the absolutely necessary amount of decoration is permitted to remain on the stage. No packing material, boxes, or any other easily ignitible material, is allowed to remain under the stage. The doors of the stage leading to corridors and dressing rooms must be smokeproof and fireproof and must open out. *Workshops of carpenters and painters* shall have no connection whatever with the audience room, stage rooms, stairways or corridors.

Smoking is, naturally, forbidden. All corridors, stairways and landings shall be constantly kept free of all obstacles tending to interfere with quick passage. Curtains must be on rings and easily removed. No trelliswork of any kind before the windows. The doors of the audience room must also open outwards. Emergency lights must be at all exits and must be often tested. These shall consist only of candles, oil lamps, or batteries which are independent of all other apparatus.

All fire-extinguishing apparatus must be in serviceable condition and not covered by other objects. Decorations shall not interfere with proper functioning of iron curtain. During the night and between acts the curtain must remain down and before each performance it must be tested. This work is in the hands of the fire brigade department and the assignment to theaters often changes, thus bringing the men and inspectors in contact with varied conditions. There is a place provided on each side of the stage for the fire watchmen who always have their eyes on the stage during the performance.

Emergency lights must be lighted from the time the box office is opened till end of performance. The gas shutoffs shall be so planned and secured that unauthorized persons shall have no access. The gas arms in corridors, stairways, toilets, etc., shall have detachable keys. Gas flames must be at regulated distances from all combustible material and provided with either wire netting or other protector. The same applies to foot and side lights of the stage. The size of the theater determines whether it shall be lighted by gas or electricity.

Emergency lights must also be placed in *all public assembly halls, churches, schools, etc.*, and do not come under this regulation.

No workshops or factories subject to outbreaks of fire are permitted to exist over or under public assembly halls. Similar places shall also not have connection with audience room, stairways or corridors. Assembly halls shall have only fireproof decorations. Concerning steps in passages and corridors, it is advisable to remove them and substitute an incline, if it is not at too great an angle. Non-fireproof decorations shall be covered with waterglass up to a height of 2 meters. Iron stoves shall be completely surrounded by an iron screen for the protection of women's clothing.

Large department stores. Not every store that calls itself a "department" store is considered one by the inspectors. The severe regulations are generally applied only when the department stores consist of several floors. Smoking is, of course, forbidden and it is a part of the regulation that a conspicuous sign to that effect shall be hung up at the entrances. Heating plant shall be central only. Radiators shall be protected. Lighting by petroleum is forbidden. Chandeliers must hang free and protected from all contact. Gas lighting shall be used principally over passageways and not over stocks of goods, thus preventing possibility of falling sparks igniting goods. Show windows must be lighted from the outside. Exception to this rule is made when show windows are made fireproof and shut off from the store proper. Then a glass top must be placed between the lights and the goods exhibited. Packing and exhibition rooms are to be fireproof and not connected with salesrooms. Cellars shall not be larger than 500 square meters and shall be provided with fire walls. Stairways must not lead to cellar rooms. Elevators running to cellar rooms shall be enclosed within fire walls. All doors open outside. Emergency lights and exits must also be provided. Fire escapes are to be brought on and run to within 3 to 4 meters of the ground.

Regulations Regarding Fire and Light

By far the most fires are caused by carelessness with fire and light. It is not deemed necessary to enumerate all the well-known cautions respecting throwing down burning matches, cigars and cigarettes, and children playing with matches, although many fires here, as well as in other parts of the world, are attributed to these causes.

In contracts covering the rent of apartments, it is forbidden for the lessee to *carry an open light* into either *attic or cellar rooms.* There is also an imperial law forbidding this, reference to which is posted on attic and cellar doors.

In *workshops and packing rooms,* after the day's work has ended, all combustible material, such as paper, shavings, etc., must be removed and brought to a place of safety for the night.

All fires for the purpose of drying out damp walls and newly constructed houses, open signal lights, etc., must have a watchman.

The most dangerous material is mineral oil, and especially *benzine.* The ever-increasing use of this article in both household and industrial life calls for greater precaution and more stringent regulations respecting its storage. Its greatest danger lies in the fact that it evaporates even in normal temperature, mixes with the surrounding air, and forms a very dangerous explosive which the smallest spark or gas jet burning in an adjacent room would set off. This explosive gas is not always distinguished by smell, and therein lies the great danger.

Locomobiles, such as are used for agricultural purposes and in some industrial branches, shall be fired with coke or some other easily combustible material when operated in any locality where sparks would be dangerous.

In small villages and isolated districts many fires have been caused by hanging washing and wet clothes too near the fire.

Piles of firewood are not allowed to be stored outside or allowed to remain without cover for any length of time, and it is required that the wood shall be so packed inside that in case of fire the living rooms will not be in danger; it must also not interfere with escape from the house.

PREVENTIVE MEASURES CONCERNING BUILDINGS IN GENERAL

When show windows extend to the basement, the rooms located in immediate vicinity must have fireproof walls.

Entrances to stores, magazines, workshops, etc., leading from the street must be of fireproof construction. Doors leading from staircase to rooms in which explosive material is handled must be fireproof.

Show windows in large stores or storage rooms shall not open on to staircase, and shall not have other opening leading to adjacent rooms except by fireproof doors.

Windows or ventilator openings in cellars or attic rooms, also other rooms in which easily combustible material is kept, must be provided with spark nets, the mesh being at least 144 to the square centimeter.

Ashes, wood and coal are not allowed to be stored in attic rooms. In workshops and storehouses, ashes and burnt coals, when not immediately removed from the building, must be kept in fireproof receptacle. Inspectors keep this regulation strictly in force.

Cellars and attics must always be under lock and key. Smoking is strictly forbidden.

Cellars and other rooms in which carbide, celluloid, and fluids or material likely to develop explosive gases must be continually ventilated.

All factories and industrial buildings shall have at least *two staircases,* which shall serve for those employed in the upper floors as a means of escape.

Windows in the upper floors of such buildings shall not be provided with either blinds or roll-blinds. Windows in iron frames must be so constructed that at least one square in each will be sufficiently large enough to permit a man of ordinary size to get in or out.

Between the ceiling and light protector for lamps there shall be a free space of 5 centimeters. The chandelier must be fastened to ceiling by means of screwhook only.

Transmission belts or supports for same shall not be brought in over doors.

All windows leading from rooms to staircases in which explosive material is kept must be fireproof.

Exit doors in churches, concert halls and theaters must open outwards.

In all hospitals, barracks, churches, concert halls, hotels, railroad stations, etc., reserve means for lighting purposes are to be provided.

FIRE PROTECTION IN EXHIBITIONS

As the buildings usually constructed for exhibitions are of light construction, it requires a special permit from the police to erect them. The regular fire regulations do not apply here, but special precautions are taken in planning and locating the various buildings. If there are a number of structures of various heights and sizes they are so grouped that two very high buildings do not stand opposite each other, but one high building may be surrounded by several smaller ones, because the spreading of a fire by sparks is most certain when two very high buildings stand opposite each other. During the exhibition a very close watch is kept by a large staff of men.

THE DUTY OF A FIRE BRIGADE DURING AND AFTER A FIRE

NOTE.—In case of any fire the question of *human life comes first,* then property. The available material under this head is so strictly professional that it is not believed it will serve the purpose of this report.

Upon arriving at a fire the first duty of a brigade chief is to ascertain whether or not human life is in danger. The firemen are at once ordered to search the rooms of the burning building. This work goes hand in hand with the work of extinguishing the fire. After it is definitely known that life is no longer in danger, the fire chief immediately decides upon the point which he considers the most dangerous and one from which the fire is most likely to spread.

In the fire departments of both Germany and Austria there is essentially a military spirit. "Attack is the best means of defence." The officers of the fire department are selected very carefully, and if personal characteristics do not include courage, quickness of decision and far-sightedness, technical training and practical experience will avail nothing. A chief is expected, upon arrival at a fire, or as soon as he can take in the situation, to determine quickly the extent and possibilities of the fire and whether or not he will be able to handle it alone. The principle generally followed in Germany is to be on the safe side and call several brigades and thereby create a reserve.

The designation, "large fire," is given when two or more lines of hose are used. "Medium," when one line is used, and "small" when the fire is extinguished by other means.

Fires in spinning and cotton mills are often caused by badly arranged heating and lighting apparatus (especially short circuit), and by pieces of cotton becoming ignited by friction of machinery. The only effective means of prevention here is to have the several rooms separated by fireproof walls. The sprinkler apparatus is also good and has been the means of retarding the progress of many fires in Germany.

Fires in chemical and mineral oil factories, benzine washeries, distilleries and cellulose factories, present many difficult problems on account of the constant danger of explosion and the high degree of heat that is developed. Establishments of this nature should keep the fire brigades of the immediate vicinity constantly informed concerning the status of stock, its location, etc., in order that when fire breaks out the firemen can work more to advantage.

All repair work done on churches and on other buildings which high towers is carried out under the eyes of fire brigade watchmen who are on duty as long as the repair work goes on. Work requiring the use of open fires, such as for soldering, is specially watched. Fire chiefs are expected to become familiar with all doorways, passages, etc., of churches in "times of peace."

Lumber yards are a constant source of danger. A very effective method of prevention here is the system employed in stacking the lumber. The latter is piled in sections with at least 12 meters between each section. Roadways at least 50 to 60 meters in length and 20 meters wide are also provided; they must be kept free of all kinds of combustible material, especially bark, chips, shavings, etc., which are so easily ignited. Fires in lumber yards are caused mostly by flying sparks and the sun's rays.

When fires break out in living apartments, the fire brigades give a great deal of attention to protecting property. Furniture, pictures, etc., liable to be damaged by water or smoke are removed to a place of safety and covered. In some cases, however, the danger of the fire spreading is so great that this work of saving property cannot be attended to.

During the Christmas shopping period the security of large department stores is placed in the hands of professional firemen, a large number of whom are on duty continually. Some of the largest department stores have their own firemen and a modern equipment of signal apparatus.

Watchmen in theaters and public assembly halls must report for duty one hour before the time for the performance or meeting and make tests of all apparatus, lights, signals, etc. No single chairs are allowed in such places. Chairs must either be fastened together in sets of at least six, or, if single, secured to the floor.

NOTES FROM BERLIN BUILDING REGULATIONS

Viewed from the standpoint of hygiene and safety, the Berlin building regulations, which have been in force since 1883, are probably the best of all large cities of the world.

The height of buildings is limited to 22 meters—72 feet, upon which a roof with slant of 45 degrees may be added.

One of the best features of the regulations is the size of courtyards and the proportionally extensive surface of the ground space which must be left unbuilt. Light and air cannot be taken from ground which does not belong to you. To compute the surface of any ground space which must be left free for courts, the plan of the same is divided into zones by means of lines running parallel to the street line. The first zone reaches to a depth of six meters (1 m. = 3 feet 4 inches), the second reaching from here to a depth of 32 meters measured from the street line.

The first zone (10) can be built entirely; of the second zone 3/10 must be left for a court or courts. If the ground space is deeper than 32 meters, 4/10 of the space lying behind the second zone cannot be built on.

The fractional parts of the space (zones) thus reckoned are added together, the result being the surface to be left for courts for the entire ground space, the position and size of which the architect then determines according to special regulations.

Every room, office or loft intended for home industry, having no window opening on the street, must be lighted direct and air admitted from a so-called main court, which must contain at least 80 square meters or about 200 square feet, and measure at least 20 feet across. If ground space is so small that the computed court surface is less than 800 square feet, the size of the court can be reduced to 600 square feet with 20 feet minimum distance across, on condition that a second small court or air-shaft at least 100 square feet in size (6 feet 8 inches) is the smallest dimension across.

If the surface in the rear of the first zone does not exceed 500 square feet a main court is not compulsory, provided all the rooms, offices or lofts receive direct light and air from the street, but the building must contain a so-called by-court or secondary court occupying at least 250 square feet and measuring at least 13 feet 6 inches across. Rooms receiving their sole light and air from such secondary court are not for a permanent living abode.

Half the surface of a main court of larger size than 800 square feet of a building for business purposes only, containing living quarters solely for porter or watchman, can be utilized on the ground floor, but must be covered by a glass roof not higher than 6 feet 4 inches above the ceiling of the ground floor. This surface can also be separated from the rest of the court by a wall reaching to the glass roof. Factories, restaurants and cafés, industrial plants that incur danger from fire, and workshops which do not belong to a business establishment in the house, are not accorded this privilege.

The planning of courts is hampered by the regulations governing the height of the building surrounding the court, neither side of which may exceed the width of the court at right angles to it by more than 20 feet. If the court is rectangular, having two long and two short sides, a mean height can be given to all four sides, *i. e.*, the long side walls can be built higher than 20 feet in excess of the opposite width of the court, if the short side walls are reduced in height proportionately.

The height of any wall abutting on a court must never exceed double the width of the court measured at right angles to the wall, and in no case exceed 73 feet.

The safety, security and good hygienic conditions of Berlin's apartment, business and industrial buildings of later date are the excellent results of these rigorous regulations, from which the above notes have been made.

APPENDIX 8

CHEMISTRY OF FIRES AND CHEMICALS IN FIRES

By Mr. Chas. A. Hexamer, Secretary Philadelphia Fire Underwriters' Association, and of the Philadelphia Fire Prevention Commission

A fire may be described to be a phenomenon due to combustion or oxidation of a substance, evolving heat and light. Oxidation without light, even though heat is evolved, is not fire. Oxidation always produces heat, but generally in such small quantities that it is imperceptible. However slight the heat evolved in the oxidation of a substance may be, if confined, it may nevertheless in time raise the temperature of the substance undergoing oxidation to the point of ignition, resulting in fire.

Chemically, therefore, a fire can be described as oxidation at a temperature at or above the point of ignition of the oxidized substance. As an example, phosphorus when exposed to the air will slowly oxidize for some time before igniting, heat being evolved. When the temperature of the phosphorus has increased sufficiently, it bursts into a flame. The same chemical action takes place throughout the experiment, namely, the conversion of the phosphorus into phosphorus oxide by absorption of oxygen from the air.

Inasmuch as air is composed of a mixture of several gases, and as oxygen represents but a small part of air, the oxidation and combustion of phosphorus in air is slow in the beginning and becomes violent only after sufficient heat has been evolved. If, however, a piece of phosphorus be dropped into a jar containing only oxygen, the process of oxidation is violent and fire ensues more rapidly. The facility with which phosphorus ignites when exposed to the air necessitates the storage of this substance under water. In this case of phosphorus we have an example of oxidation and subsequent ignition of a combustible substance.

It is not necessary that a substance burn in itself in order that oxidation may produce fire. A number of chemicals when combining with oxygen evolve so much heat that ignition of combustible substances nearby ensues. As an example, sodium, a chemical met with everywhere, although not in an uncombined state, has a great affinity for oxygen. When exposed to air sodium absorbs oxygen and is changed into caustic soda. A slightly perceptible quantity of heat is evolved. If we immerse a piece of sodium in water, fire is the immediate result. Water is composed of two gases—hydrogen and oxygen; oxygen being necessary to cause combustion, and hydrogen being inflammable. Sodium when brought in contact with water robs the water of its oxygen in so violent a manner that heat is evolved to raise the temperature of the hydrogen liberated sufficiently high to cause ignition. The sodium is converted into caustic soda, but being soluble in water it is apparently consumed. We have here a chemical action producing fire in which water is necessary to produce the result.

In practice we find that in many cases water is necessary to produce ignition. Nearly every case of spontaneous combustion can be traced to or is at least accelerated by the presence of moisture. It is a well-known fact that oily waste or rags containing vegetable or animal oil will ignite spontaneously much more rapidly when moist than when perfectly dry. Spontaneous ignition in such cases is due to oxidation, and only oils having the property of absorbing oxygen from the air are liable to cause spontaneous combustion. The presence of moisture accelerates the chemical action and makes it more violent, raising the temperature of the nearby substance, rags or waste, more rapidly and causing fire. Recent investigation has shown that phosphorus, when subjected to oxidation in absolutely dry oxygen, will not ignite.

It is safe to assume that spontaneous combustion due to oxidation will not produce fire if water or moisture is not present. Oxidation produces heat. Unconfined, this heat dissipates, and the substance or nearby substances are not heated to a point of ignition; hence no fire ensues.

The temperature of ignition of various substances is therefore of great interest to insurance underwriters, and the examination of tables giving the temperature of ignition of substances commonly met should not be neglected. The temperature of ignition varies in cases of different substances between very wide limits. Some gases ignite immediately on coming in contact with air. Some metals, in a finely divided state, ignite when brought in contact with the air. Such substances are known as pyrophori. Other solids commonly met with ignite at as low a temperature as 300 degrees and even lower—a notable instance being celluloid and guncotton, which bursts into a flame when heated up to 300 degrees.

As an example, a fire caused by the ignition of celluloid occurred in a Philadelphia factory for manufacturing advertising novelties, where a quantity of celluloid in sheets was stored on a shelf, and an incandescent electric lamp suspended from the ceiling by a flexible cord in front of the shelf was placed on the celluloid by some one who found it in his way—no current being on at the time. When the time came for lighting up, this lamp was lighted with the rest. Within a very short time the celluloid burst into flame, igniting nearby material. A very stubborn and serious fire ensued. The ignition in celluloid comb factories of celluloid scrap which has been swept up and allowed to accumulate around steam pipes passing through the floors is of frequent occurrence.

Having considered briefly the chemistry of fires, I propose to take up the main part of my paper, namely, "Chemicals in Fires." This subject may be divided into a number of subdivisions:

I. Chemicals producing fire by spontaneous combustion due to rapid or slow oxidation.

II. Chemicals which either by themselves or in combination (although they do not have the property of spontaneous ignition) greatly increase the fire hazard by reason of their great combustibility.

III. Explosives.

IV. Chemicals which are neither highly combustible nor explosive but may cause an increase of loss when in a fire owing to their poisonous nature.

---

(1) *Under the first class,* one of the most ignitible of chemicals commonly met with is *phosphorus.* As stated before, phosphorus when exposed to air at once absorbs oxygen, and in a very short time sufficient heat is evolved to ignite the phosphorus, the product of combustion being phosphoric oxide. Phosphorus is met with in only a limited class of risks, such as wholesale drug houses and match factories. It is manufactured from phosphate, either mineral (such as phosphate rock found in large deposits in some of the Southern States) or from bones which contain phosphate of lime by the action of strong sulphuric acid on either of these substances, and subsequent distillation in the presence of carbon and silica; and, more recently, directly from phosphate rock by electrolytic action. Ordinary phosphorus, on account of its great ignitability, is always stored under water, usually in tin canisters. When so stored it is comparatively safe. Amorphous or red phosphorus, having very slight tendency to oxidize, is not a hazardous substance. Phosphorus is used chiefly in match factories, where in combination with other chemicals it forms the mixture composing the matchhead. In phosphor-bronze foundries, phosphorus is used in limited quantities, the hazard being only that of storage, as the phosphorus hazard is immediately eliminated when the substance is mixed with the other ingredients forming phosphor-bronze. Amorphous phosphorus is frequently used in manufacturing flash powder for photographic purposes, and the composition of the matchhead.

Sodium and *potassium.* These substances play quite an important rôle in the study of chemicals in fires. They are not met with in nature in an uncombined state, being generally found in combination with other chemicals in the form of oxides, chlorides, nitrites, chlorates and nitrates, etc. Sodium is manufactured chiefly from chloride of sodium, or common salt, and also from nitrate of soda, or Chile saltpeter, by electrolytic methods. It is a metal resembling lead but much softer and brighter in color. Its affinity for oxygen is so great that when exposed to the air it is at once coated with a white incrustation—soda. I have described to you the action resulting when sodium is thrown into water. Like phosphorus, sodium must be stored in a special manner to avoid ignition or oxidation, and for this purpose a mineral oil such as kerosene or paraffin oil is used. Unless it be in chemical works, sodium is not often found in manufacturing risks. Some of the chemicals containing sodium, however, such as chlorate of soda and peroxide of sodium, are used quite extensively, the former as an oxidizing agent and the latter for bleaching purposes. While chlorate of soda becomes dangerous only when in combination with other chemicals, or by its presence in a burning building, peroxide of sodium may be properly classed as a chemical causing fire by oxidation, especially when moisture is present. Nitrate of soda, or Chile saltpeter, while a combustible chemical does not ignite spontaneously and is dangerous only when in a burning building.

Potassium is a chemical similar in appearance and properties to sodium. Excepting in laboratories it is seldom met with and has no special use in manufacturing or in the arts. Of the commercial potassium compounds the peroxide can be classed as an oxidating substance likely to cause spontaneous ignition. The chlorates, nitrates and permanganates of potash we will consider in the second class.

Among the substances having the property of absorbing oxygen, and therefore one likely to cause spontaneous ignition, carbon in its various forms is of great interest. It is a well-known fact that carbon in the form of charcoal, lampblack and boneblack will, when in a finely divided state, absorb many times its volume of oxygen. This absorption cannot be properly classed as oxidation as no chemical combination takes place unless ignition ensues. Ignition will not ensue, however, until the temperature of a portion of the carbon has been raised above its point of ignition, which is about 750 degrees. In an exceedingly finely divided state and moderately heated some forms of carbon will ignite when brought in contact with air.

Excepting when spontaneous ignition of charcoal or boneblack takes place in a pile of either of these substances shortly after they have been removed from the kilns, which ignition may be attributed to the fact that the heat in the center of the pile confined, accumulated and caused fire, spontaneous combustion of any of the forms of carbon mentioned is always accelerated by the presence of moisture. The storage of charcoal in large quantities, of lampblack in bulk, and of boneblack before it has been properly cooled, must be looked upon as sources of danger. As these three substances are very frequently met with in practice, it may be well to briefly explain the process of their manufacture.

Charcoal is manufactured from various kinds of wood, either hard or soft. Generally the manufacture is done in a crude way. The wood, after being cut into suitable lengths, is piled up and then covered with earth and sod so as to exclude all the air excepting a small quantity necessary for slow combustion. The wood is then ignited and allowed to burn slowly until all the easily combustible parts have been consumed, the remainder being charcoal. More recently brick-kilns have come into use for the manufacture of charcoal. Charcoal is also obtained as a by-product in the destructive distillation of wood in factories manufacturing wood alcohol, pyroligneous acid, etc.

Lampblack is obtained from burning oils in furnaces so arranged that combustion is retarded, causing a heavy smoky fire. The smoke or soot is carried into chambers constructed for the purpose, where the soot settles on all sides. At stated intervals these chambers are cleaned out and the soot collected. This soot is known to the trade as lampblack. It is one of the purest kinds of carbon. When piled in quantities or when slightly moist lampblack is subject to spontaneous ignition in a marked degree. Lampblack is generally used as a pigment, being ground in linseed oil or varnish for paint or printing ink. Mixed with linseed oil for grinding into paint it should never remain in a partially mixed or unground condition, as the mixture is very apt to ignite spontaneously.

Carbon black, a substitute for lampblack, is manufactured from black ash, a waste product resulting from the manufacture of wood pulp by the soda-ash process. It is claimed that this substance does not ignite spontaneously.

Boneblack, as its name indicates, is manufactured from bone. Dry, cleaned bones, ground to coarse powder, are placed in a retort and subjected to a hot fire, Destructive distillation takes place. Ammoniacal vapors are given off from which sulphate of ammonia is manufactured as a by-product of some importance. When the distillation is complete, the contents of the retort are drawn and placed in iron boxes which are immediately sealed to exclude the air. In this condition they are allowed to become cold when the contents is removed as boneblack. Boneblack is used principally in sugar refineries for filtering and decolorizing sugar. When used for this purpose for some time, boneblack loses its property of decolorizing and must be burned over, or revivified, which is done in kilns in the char or filter house of the sugar refinery. Inasmuch as the filtering process and the subsequent reburning of the boneblack is continuous, the storage of large quantities of boneblack in the filter house of a sugar refinery is no longer necessary, and spontaneous ignition of boneblack in the filter house is therefore not so likely to occur.

Spontaneous ignition of coal in piles is of frequent occurrence. It is claimed that bituminous coal alone is subject to spontaneous ignition. Also that less than 1 per cent. of sulphur in such coal will prevent it from igniting spontaneously. The decomposition of sulphite of iron (iron pyrites) in the coal produces the chemical action accompanied by heat which when confined results in the ignition of the coal. The presence of moisture greatly increases the danger.

While oils are not generally classed as chemicals, it seems proper at this point to consider such oils as may be classed with substances producing spontaneous combustion by oxidation. Vegetable oils and animal oils generally can be so classed, the former being considered much more likely to cause spontaneous ignition than the latter. Linseed oil, both raw and boiled, and cottonseed oil, among the vegetable oils, having the greatest affinity for oxygen are the most dangerous in this respect, and rags or waste containing either of these oils should be very carefully looked after. Animal oils are not so apt to cause spontaneous ignition. They are sufficiently dangerous to warrant the careful removal from the building of all rags containing animal oil or grease. Press cloths used in manufacturing lard or tallow oils when washed should never be allowed to accumulate in piles, but should always be hung up separately until dry, as they will otherwise be very likely to heat and ignite. Mineral oils, not having an affinity for oxygen, do not cause spontaneous ignition.

The following rule is a safe one to determine whether an oil is likely to cause spontaneous combustion: No vegetable oil will cause spontaneous combustion unless it has the property of drying by reason of absorbing oxygen, and no animal oil will cause spontaneous combustion unless it has the property of becoming rancid. The danger of causing fire is directly proportionate to the degree that an oil may have either the one or the other of these properties. There are quite a number of substances known to the chemist which have the property of causing fires by absorption of oxygen, but fortunately few are used in manufacturing in sufficient quantities to be of special interest to the underwriter.

---

(2) *We now come to the second class*—chemicals which in connection or combination with other chemicals or substances produce fire. It will be impossible to discuss this class in detail on account of the very large number of substances which properly belong to it. I will therefore limit myself to explaining some of the cases more frequently met with. Among these, the chlorates and nitrates of both soda and potash are the most important. Chlorate of soda is used in dyeing establishments as an oxidizing agent, being cheaper than chlorate of potash, and containing a larger percentage of oxygen; also, under certain conditions, this chemical produces more energetic oxidation. When mixed with an organic substance and an acid, as is the case at times in dyeing establishments, fire may ensue unless great care is exercised in handling the mixture.

Chlorate of potash you are all familiar with. This substance is also largely used in dye works. Mixed with certain organic substances—sugar, starch, carbon, etc.—chlorate of potash becomes explosive. The same condition arises when sulphur or amorphous phosphorus is added to this chemical. As an example of chemicals producing fire, no experiment is better known than when chlorate of potash and sugar are mixed and a drop of sulphuric acid is poured on the mixture. Violent chemical action takes place, the sulphuric acid decomposing the chlorate of potash and liberating oxygen, sufficient heat being evolved to ignite the sugar, which in the presence of the liberated oxygen burns with great violence. This property of chlorate of potash, and in fact of all chlorates and nitrates, of giving off the oxygen they contain either by chemical action or by reason of being subjected to the heat of a fire, is the cause of the danger arising from these chemicals.

Mixed with sugar and compressed into tablets chlorate of potash must be considered dangerous, as this mixture may ignite by accidentally coming in contact with acid, or when subjected to heating in dry rooms. Combined with muriate of ammonia and formed into tablets, chlorate of potash produces a mixture which is dangerous, from the fact that chemical action producing heat and possibly fire is likely to ensue when this mixture is exposed to a slight heat, even the heat of the sun being sufficient. These tablets mentioned are frequently made up in pharmaceutical establishments, and their manufacture constitutes one of the hazards of such risks.

Chlorate of potash is also one of the main ingredients of the flash powders used by photographers; sulphur, picric acid, or amorphous phosphorus, being some of the other chemicals used in making this dangerous composition. Numerous explosions, causing fire and loss of life, have occurred from carelessly compounding and carelessly handling flash powders. In fact, the ordinances of the city of Philadelphia treat this substance as a high explosive and prohibit its manufacture. Chlorate of potash, mixed with amorphous phosphorus, also forms the main portion of the mixture used in manufacturing parlor matches. Safety matches also contain chlorate of potash but no phosphorus, that substance being contained in the composition on the box on which the match must be rubbed to cause it to ignite. It has been claimed that chlorate of potash is not explosive in itself, and that sulphur or a carbonaceous substance must be mixed with it to cause explosion. But recent experiments have shown that in a fire where chlorate of potash is alone present the oxygen thrown off by the burning chemical, mixed with the smoke from burning wood, will form a very explosive mixture which will at a comparatively low temperature ignite without a flame.

Mr. McDevitt, of my city, has shown some very interesting experiments demonstrating this fact. His experiment is as follows: In a tin can, arranged to be closed by a tight-fitting cover, a small crucible containing chlorate of potash and a second crucible containing a piece of wood are placed; the tin can is then subjected to the heat of a gas flame; when the temperature has been raised to about 500 or 600 degrees a violent explosion occurs. Mr. McDevitt is of the opinion, and I have no doubt correctly so, that the oxygen given off by the fusing chlorate of potash and the hydrocarbon gas given off by the charring of wood are ignited spontaneously when the temperature of ignition of this mixture of gases is reached. Mr. McDevitt goes so far as to give this experiment as an explanation of the Tarrant explosion, attributed to chlorate of potash, in New York a few years ago. Nitrate of soda and nitrate of potash act in a similar manner. It must, therefore, be clear to you that the storage of these substances in a warehouse constructed of combustible material is dangerous, even when these substances are stored by themselves.

Nitrate of soda is a chemical used quite extensively. It occurs in a natural state in large deposits in Chile and is known to the trade as Chile saltpeter. This chemical is used in glass factories, in fertilizer works, in sulphuric acid and nitric acid plants. By itself nitrate of soda does not easily ignite. This is due to the fact that it has the property of attracting moisture, or is, as it is chemically called, a hydroscopic substance. Bags having contained nitrate of soda are classed as a hazard in risks using this chemical, owing to the custom of washing out and drying the bags for future use. A spark lodging in such bags, when dry, soon causes a violent flame and a fire which is very hard to extinguish, because of the fact that water thrown on such a fire is likely to cause an explosion. Burning chlorates and nitrates are also considered specially dangerous from this fact. The niter bag hazard exists in every factory where nitrate of soda is used. In fact, owing to the custom of some factories of selling their empty niter bags to rag dealers, this hazard from niter bags may be found in rag warehouses and even in paper mills using this grade of stock. Nitrate of soda, when melted or fused, has also the property of causing ignition when it comes in contact with charcoal or charred wood which has been heated.

Nitrate of potash, which is usually manufactured from nitrate of soda, is less frequently used in manufacturing establishments. This substance, commonly known as saltpeter, is extensively used only in powder mills, a class of hazard the underwriter is not, as a general thing, interested in. In packing houses saltpeter is also used to some extent, and what has been said about the hazard of empty bags having contained nitrate of soda is equally true as to empty saltpeter bags.

Nitrates of lead, barium, ammonia, strontia, etc., are all met with in practice, but not in quantities sufficiently large to warrant considering these chemicals at this time. Nitrate of ammonia is, however, somewhat interesting, as it is from this chemical that nitrous-oxide or "laughing gas" is manufactured. This gas is stored in steel cylinders, compressed at a pressure of many atmospheres into a liquid, and may be found in nearly all dentists' offices. In a fire there is some danger from the fact that gas expands very rapidly when heated, and an explosion of a cylinder containing nitrous oxide under pressure may be very disastrous. Nitrate of ammonia can be classed as an explosive, as it forms an important part of Sprengel's explosives.

Calcium carbide, the substance from which acetylene gas is obtained, has become of great interest to the underwriter. By itself neither combustible nor explosive, this chemical, when water is added to it, causes double decomposition, resulting in an inflammable gas and an incombustible residuum. The chemical action taking place is simple and interesting. Calcium carbide is manufactured by fusing powdered quicklime and coal in an electric furnace at a great heat, the resulting solid being a hard substance of granular nature, and, as stated, neither combustible nor explosive. When water is added to this substance, or when it is thrown into water, the oxygen of the water combines with the lime, and the hydrogen of the water with the carbon, this latter product being acetylene, a colorless gas of about the same specific gravity as air, very inflammable, burning with a very bright flame at a temperature of ignition of about 900 degrees.

Sulphur, or brimstone, is frequently met with in manufacturing establishments, principally chemical works, where it may be stored in large quantities. This chemical is found in nature in a pure state in mines and in craters of volcanoes. It is also largely distributed combined with other substances, as sulphates, sulphides, and sulphites. Sulphur is used principally for manufacturing gunpowder, as a disinfectant, and also for manufacturing sulphuric acid.

The process of manufacturing sulphuric acid is of interest to the underwriter. It is briefly as follows: Sulphur or a sulphide, principally that of iron (iron pyrites), is burned in a furnace, the fumes given off consisting principally of sulphurous acid. The sulphurous acid fumes are collected in lead chambers so arranged that they stand in shallow leaden troughs containing water. Nitrous oxide vapors derived from the fusing of nitrate of soda in a separate furnace and aqueous vapors are allowed to pass into the lead chambers and are there robbed of a portion of their oxygen, changing the sulphurous acid into sulphuric acid. This acid is absorbed by the water in the shallow trough, which then is known as dilute sulphuric acid or chamber acid. By boiling down or concentration the chamber acid is converted into the commercial acid, or oil of vitriol. Sulphur is a combustible substance, having a low point of ignition and burning with a low temperature. When a pile of sulphur is ignited in a warehouse the flame soon extinguishes itself by reason of the fact that the sulphurous vapors given off are one of the best fire extinguishing gases. The fire loss to a stock of sulphur stored in a warehouse is generally small, as water has no damaging effect thereon. If, however, sulphur is stored in the first floor of an acid chamber the destruction of the acid chamber will cause very serious damage to the sulphur by reason of the lead of the chamber being melted and mixing with the sulphur, forming a mass which cannot be handled to produce a salvage. Sulphuric acid is usually concentrated in platinum pans, or stills, as they are called. These pans are quite expensive, costing as high as $20,000. When located in the first floor of the acid chamber a serious loss to the underwriter, in case of a fire, may result from the fact that molten lead coming in contact with platinum will unite, forming an alloy, by melting the platinum. Although platinum fuses at the very high temperature of 2200 degrees and lead at 730 degrees, it is a fact that molten lead will dissolve platinum at the low fusing point of lead.

Permanganate of potash is not often stored or used in quantities large enough to require its consideration in detail. This substance, owing to the fact that when subjected to fire it gives off large quantities of oxygen, may become dangerous or even explosive when in connection with an organic substance easily oxidized, such as carbon, if it is subjected to the high temperature of a fire.

The chemicals we have considered embrace the more important inorganic solid chemicals met with in the general practice of an insurance inspector.

Acids, such as sulphuric, hydrochloric and nitric, must be considered from a fire point of view. Of these nitric acid, either the ordinary or the fuming nitric acid, is classed with chemicals likely to produce a fire. Nitric acid is stored for commercial purposes in glass carboys, surrounded with hay, and crated. Should such a carboy break by accident the acid coming in contact with the hay would cause it to ignite. With sulphuric and hydrochloric acid this danger is not so great. Although the hay, in case of the breakage of a sulphuric acid or hydrochloric acid carboy, may be carbonized or charred, it is not readily ignited. Fuming nitric or fuming sulphuric acid are, however, very dangerous, and a breakage of a receptacle containing either of these substances will cause a fire. Muriatic acid is the same substance as hydrochloric acid under another name. Acetic acid, pyroligneous acid and tartaric acid are organic acids. They are *not* inflammable nor likely to cause ignition.

Carbon disulphide, among the liquid chemicals, is a substance of great interest in the study of fire-producing chemicals. This substance, owing to its property of dissolving grease, fats, rubber, and in fact all gums, is frequently used.

Carbon disulphide is obtained when sulphur fumes are allowed to pass over charcoal heated to a cherry red. When refined, carbon disulphide is a colorless mobile liquid of aromatic taste and pungent odor. The point of ignition of this substance is about 300 degrees. It will be readily seen that its storage and use is exceedingly dangerous. Gutta-percha cement consists of rubber or gutta-percha scrap dissolved in carbon disulphide. Phosphorus dissolved in carbon disulphide ignites spontaneously when brought in contact with air.

With the danger of fire existing in the storage and use of the various products of petroleum you are undoubtedly familiar. Benzine, naphtha and gasoline are names of substances with which the underwriter has become acquainted at considerable expense. These substances, all products of petroleum, differing only in the degree of temperature at which they volatilize, have become of such extensive use in manufacture and in the arts that a description of the various processes into which they enter and the various purposes for which they may be used would alone fill a volume. The danger in the use of these light petroleum products is due to the fact that at an ordinary temperature they give off vapors easily ignited by an open light or even a spark, either frictional or electric, also from the fact that this vapor when mixed with air at certain proportions will produce a gas which is violently explosive.

Countless fires and explosions are on record due to the use of these substances. Millions of dollars have been contributed by them to the annual ash heap and many lives sacrificed. Although the insurance engineer has expended his best efforts in trying to safeguard, as far as possible, the use of these substances, their use on any premises must always be recognized.

The coal tar products, by which we understand those chemicals, both liquid and solid, are obtained from the destructive instillation of coal either in the manufacture of gas or coke. Owing to their complex composition and the danger in using and handling some of their combinations, the study of this class of chemicals is one of unusual difficulty to the layman. The more common coal tar products met with in our practice are benzole (or coal tar naphtha), toluol, carbolic acid (or phenol), naphthaline and anthracene. Benzole and toluol are used principally in the manufacture of aniline colors, although numerous colors are obtained from naphthaline and anthracene. As solvents for fats, rubber and gums, benzole is also extensively used. Naphthaline has become a commercial article of some importance. After having been refined by sublimation in a similar process to that used in refining camphor, naphthaline is placed on the market as a moth preventive and is extensively used for this purpose.

The coal tar products named are all more or less inflammable and their use must be safeguarded. Turpentine, a product of distillation of rosin obtained from various coniferous trees, is an inflammable liquid extensively used in the manufacture of varnishes, and in mixing and thinning the better grades of paint. Although turpentine does not give off inflammable vapors at low temperature, the vapors of turpentine when mixed with air are quite as explosive as the vapors of benzine.

Alcohol, obtained by distillation from fermented grain, etc., must also be classed with chemicals whose presence in a fire will greatly increase its destructiveness; very inflammable and easily ignited. The vapors of alcohol with air also produce an explosive mixture. Wood alcohol, or wood naphtha, obtained when wood is distilled destructively, is similar to grain alcohol and has similar properties when in a fire.

Ether, a liquid more volatile than alcohol, is obtained from this substance by distillation after either sulphuric or hydrochloric has been added. The manufacture of ether entails a very serious hazard and its use in manufacture and the arts is dangerous. Ether is largely used in pharmaceutical establishments for extracting and is generally recovered by distillation, which distillation should never be carried on by direct fire heat. One of the most important uses of ether is as an anesthetic by surgeons.

Acetone, obtained from acetates by dry distillation, is a colorless liquid boiling at a low temperature, easily ignited and likewise gives off vapors which will become explosive when mixed with air.

Amyl acetate, a liquid boiling at 140 degrees, is quite extensively used in the manufacture of lacquers and certain grades of varnishes used on metals, and more recently on leather. Dissolved in amyl acetate, celluloid or guncotton forms a lacquer known to the trade as zaphon, extensively used in metal works. Amyl acetate or any varnishes or lacquers containing the same can be easily recognized by its odor, which resembles that of bananas and is therefore frequently called "banana oil." As stated, amyl acetate has come into use quite extensively of late for manufacturing a lacquer for use in the manufacture of enameled leather. Guncotton and celluloid in solution can be found in nearly all varnishes used for this purpose. As the substances mentioned have the property of igniting at a very low temperature, their use and presence in enameled leather works entails a serious hazard. The product from such factories, even when made up into shoes, in case of fire will cause a much greater loss to the underwriter than is usually the case when leather or shoes are subjected to a fire. In a recent fire in a shoe factory in my city it was noticed that the enameled leather vamps of all shoes which had been exposed to the heat of the fire had been destroyed, although the portion of the shoe of cloth or ordinary leather had not been injured. Neither the paper covering the racks on which the shoes were standing nor the wooden racks had been ignited or even colored by the heat. When we remember that celluloid ignites at 300 degrees and that the varnishing on the enameled leather is composed in part of dissolved celluloid the reason of this will be readily seen. In metal works where lacquering is done requiring drying rooms or ovens, the drippings which accumulated and hardened on the heating pipes had been known to ignite spontaneously on account of the presence of celluloid in the lacquer.

EXPLOSIVES

(3) The term "explosion" is rather loosely employed. A definition clearly stating what is understood by the term is given as follows: "An explosion is the sudden conversion of a solid liquid or gaseous body of small bulk into gas or vapor of many times the volume of the original body, the high expansion being greatly increased by the heat generated during the transformation." The change into the gaseous state may be extremely rapid or take place more slowly. The explosion of a steam boiler may be taken as an example of a slow explosion. The water in the boiler being slowly expanded by heat and converted into steam or vapor of many times its volume, if confined, soon produces so great a pressure on the shell of the boiler that a rupture must occur and an explosion result. Similarly, any liquid which can be converted into vapor by heat will cause an explosion if the vapor is confined. It is an error to call such liquids explosives, and the use of the term in connection with benzine, gasoline, naphtha or kerosene is incorrect. The vapors given off by these substances when heated, if confined, will cause an explosion similar to the explosion of the boiler. If the vapors or gases of benzine or any similar hydrocarbon compound be allowed to escape and become mixed with air, the resulting mixture can properly be termed an explosive. Ignited by a flame or by an increase of temperature above the point of ignition of the mixture or by an electric spark, a violent explosion follows, the result being the formation of aqueous vapors of a much greater volume than the

original gasoline mixture. The heat from the combustion of the carbon present greatly accelerates the expansion and therefore the violence of the explosion. Explosives may be defined as substances (either chemical compounds or mechanical mixtures) which can be converted into gaseous form of great volume by heat, flame, electric spark or concussion. Chemical compounds comprise what are generally known as "high explosives," such as nitrocellulose, guncotton, nitroglycerine, dynamite, nitropowder, fulminates of mercury or silver, nitrated phenols or coal tar hydrocarbons, including picric acid, picrates and Sprengel's explosives. Besides these, certain gases such as acetylene, hydrogen sulphide and carbon disulphide may be considered as high explosives under certain conditions. Acetylene and hydrogen sulphide are gases in their ordinary condition; and as such can, when mixed with air, be exploded by heat or flame similar to the hydrocarbon vapors. When these gases are changed into a liquid form under pressure they become explosives in that condition without being changed into a vapor. Carbon disulphide acts in a similar manner. Heat having been absorbed in the chemical action producing these substances, heat is given off when they are exploded and this heat greatly increases the violence of the explosion. Substances having this property are known as "endothermics," while substances where the chemical change in case of an explosion is not converted into heat are known as "exothermics." The property of absorbing heat when being chemically formed, and the fact that this heat is readily given off, is the cause of the exceedingly unstable condition of most of the nitro compounds, and to this their great danger is due. Ordinary gunpowder is a good example of a mechanical mixture explosive. Composed of varying proportions of carbon, sulphur and saltpeter, if ignited in the open air rapid combustion takes place, the saltpeter giving off its oxygen and from the carbon and sulphur combustible large volumes of gases being given off which, when confined, produce the gunpowder explosion with which you are all familiar.

The explosion of finely powdered organic substances commonly called "dust" explosions, is of interest to the underwriter. Explosions of this kind are of frequent occurrence in malt mills of breweries, in flour mills, in woodworking establishments, in sugar refineries where grinding of powdered sugar is done, and, in fact, are likely to occur in any establishments where dry organic matter is pulverized or where a fine organic dust is the result of the manufacturing process. Dust explosions belong to the class of rapid explosions. Hence their action, as is the case in all rapid explosions, is principally lateral and downward, the explanation of this being that the air surrounding the explosive has not time to get out of the way of the rapidly expanding gases. It is difficult to say what actually takes place during a dust explosion and what changes the dust undergoes. The carbon is undoubtedly consumed and the presence of the hydrocarbon gases must be assumed. Heat is generated, accounting largely for the rapidity and violence of the explosion. Dust explosions can be said to occur in two stages, (1) the ignition of the organic dust particles, and (2) the explosion of the gaseous products formed by the combustion. A phenomenon analogous to dust explosion is the explosion of oils, either mineral, vegetable or animal, when in a finely divided or atomized state. In this case there is no explosive vapor but the atomized oil mixed with air forms the explosive mixture. An interesting example of this class of explosion is that of the atomized oil blown into the air when a joint of an ammonia compressor of an ice machine gives way, and the oil used as a seal or lubricant is forced out into the air in an exceedingly atomized condition by the expansion of the liberated anhydrous ammonia. Ignited by an open gas jet a violent explosion may ensue.

The use and storage of explosive substances is, or should be, regulated by law. Unfortunately, this is not always the case. In our city, ordinances in the preparation of which a committee of the Underwriters' Association was consulted were passed by city councils. As one of that committee I examined the ordinances of most of our large cities, and found such a difference in the regulations and requirements that it occurred to me that the preparation of a standard ordinance regulating the storage and use of explosives and combustibles should be taken up by a committee in which all interests affected are represented. The work of such a committee would be difficult, laborious, and expensive, as both legal and chemical experts would of necessity be employed. Nevertheless the results of the labors of such a committee would be of great value.

(4) In dividing the consideration of chemicals interesting to the underwriter I designated a *fourth class*—namely, such chemicals as by reason of their poisonous nature would in case of fire, either by reason of giving off poisonous vapors or by reason of being dissolved by the water used for extinguishing the fire, cause a total destruction of the contents of the stores or warehouses which would be required for consumption by man or beast. If, for instance, arsenic or antimony compounds were stored above herbs, drugs, cereals, etc., in case of fire these substances would be a total loss if the water used in extinguishing the fire should, after having passed through the arsenic or antimony compounds, wet down these substances. Other soluble poisonous substances would have the same effect, and the storage of such substances must be carefully safeguarded.

APPENDIX 9

(1) An Address Urging National, State and City Organizations of Business Men to Fight Fire Waste

Board of Trade, Camden, New Jersey November 14, 1911

GENTLEMEN:

Your kind invitation to speak on fire waste at your meeting, following as it does an earlier one this Spring—which absence from the country did not permit me to accept—shows a confidence in my interest and perhaps knowledge of the subject, which may possibly in the latter respect be misplaced. I certainly appreciate the compliment and will do my best to warrant it. Some offerings, however, are burdens rather than blessings, as was the case with a friend of mine interested in an Old Ladies' Home, who applied to a well-known capitalist for a donation. "Certainly," was the prompt reply, "I will donate two old ladies."

What you want is real enlightenment about United States fire waste and not incomplete half truths which will make the subject more obscure. You do well to study this matter, and you will do better to play an active part in your State and city hereafter to help suppress one of the largest and most useless drains on American prosperity of all the many that exist.

The basic, undisputed facts are as follows:

Last year's fire loss was 214 millions of dollars, approximately the average of 216 millions for the ten years—1900-1909 inclusive. If the related expenses of fire departments and protection were added the total loss would increase to approximately 400 millions. This would roughly average $3.00 per capita vs. about 33 cents for Western Europe. Insurance costs us about 1 per cent. on the average vs. one-tenth of 1 per cent. for Western Europe.

In other words, our fire waste, and our cost for insurance, are both about ten times like averages for Western Europe.

Of our fire losses about 20 per cent. are made up from arson and over-insurance and exaggerated settlements; and about 30 per cent. more from individual carelessness, indifference and dirty housekeeping—or "personal responsibility."

Poor physical condition of construction, protection and occupancy of properties would account for another 25 per cent.

All authorities agree that fully two-thirds of all losses are preventable. United States life loss from fire averages about 1500 killed and 5000 badly injured per annum. There is also tremendous associated loss from interruption to business from fires. A reduction in fire loss would proportionately reduce the last named items.

It is not possible to now cite you chapter and verse to sustain these general facts and conclusions. The history of the subject covers our whole national life. Much has been observed, studied, spoken, written and done in this fight with the fatal as well as beneficent element—fire. I can only refer you now to the data obtainable, and leave it to your interest and enterprise to obtain and use it.

The general public awakening about fire waste may be said to have come during the past five or six years, and will be found fairly well summarized in the following articles:

1905—

The United States Department of Commerce and Labor (Bureau of Manufactures) published a report of the consular service on fire loss and insurance abroad.

This furnishes the basic foreign figures for comparison with our home conditions cited above.

1907—

The United States Department of the Interior (U. S. Geological Survey) in Bulletin No. 418 on "The Fire Tax and Waste of Structural Materials in the United States" gave a powerful warning on this subject.

1908—

At the first conservation meeting of Governors in the White House, May, 1908, I presented on behalf of the National Board of Fire Underwriters a paper on Fire Prevention, outlining the facts and possible remedies, based on my experience as chairman of the Fire Prevention Committee of the National Hardware Association of the United States at that time.

1908-10-11—

The National Board of Fire Underwriters presented further papers on fire waste at the Conservation Congresses during these years, from which quotations will later be made.

These papers give authoritative and quite complete views on our fire waste problem and the course in general terms to better it.

As chairman of the Fire Prevention and Insurance Committees of the National Association of Credit Men, National Association of Manufacturers and National Hardware Association, in the Fall of 1909 I read a paper at the fortieth annual meeting of the fire underwriters of the Northwest on "Fire Insurance and Prevention as Related to Credit," which fully enumerated the studies and authorities on the subject, and the activities at work to regulate it, and finally the necessity of *consolidating these efforts* to achieve any practical results.

In an address before the City Club of Philadelphia, January 7, 1911, and as a witness before the Legislative Investigation Committee of New York later the same Spring; in a pamphlet on proposed fire marshal legislation for Pennsylvania and Philadelphia, for a meeting of business associations at the Bourse, Philadelphia, April 26, 1911, and in an article in *The Survey* (New York), July 1, 1911, I developed a good case showing the reasons for and method of conversion of the above-cited *general* facts and conclusions into *specific* State and municipal laws to control fire waste, constituting the continuous advance of a principle of action into results.

The absolute need of complete, specific and centralized legislation to reduce life and property loss from fire is fully disclosed in the following articles:

The Survey—issue of January 7, 1911—had an article by Mr. J. P. McKeon, an engineer, entitled "Fires, Factories and Prevention," which exhaustively describes and analyzes the fire loss in life and property in the Newark factory at Orange and High streets in 1910. In this article he shows the jumble of insufficient, inefficient and unrelated State and municipal laws respecting the construction, protection and occupancy of buildings; the careless, indifferent and inefficient enforcement of such laws as existed, and the lack of any real and continuous inspection from any source, to insure any reasonably effective control.

In *McClure's Magazine*, September, 1911, is a forceful editorial on "The Fire Question in the United States."

In the same issue an article by Mr. Arthur McFarlane, entitled "Fires and the Skyscraper," fully discusses the Washington Place, Asch building, or "Triangle," fire in New York City in March, 1911, with its causes and needlessness.

In *McClure's Magazine*, December, 1911, Mr. McFarlane has another article entitled "New York's Conflagration Peril," which discusses the fire and conflagration hazard in New York City at present.

The *Journal of Commerce and Commercial Bulletin*, New York, in an editorial in issue of March 29, 1911, lays pronounced emphasis on the governmental conditions in the city of New York which made the Triangle fire possible; adding cumulative evidence to that above cited, especially concerning the Newark fire, as to the conflict of authority supposed to control fire waste at present in practically all States and cities.

Everybody's Magazine, November, 1911, has an article by Messrs. Leon Platky and Walter Lippman which throws light on the serious arson conditions under the present imperfect laws and enforcement of same.

Mr. Franklin H. Wentworth, Secretary of the National Fire Protection Association, has in repeated addresses called for the gradual construction of a fire-stop cross in all cities, dividing their areas substantially into four parts—this cross to be effected by taking two intersecting main avenues and gradually improving the construction of the buildings along them so as to resist the march of conflagration.

The only reasonable deduction from all this evidence is that, as regards fire waste, all over this country *public opinion, general building construction, improvement, protection, occupancy* and *housekeeping; legislation* both State and municipal, and *inspection under* and *enforcement of* existing laws, are in the main loose, unrelated, lacking in uniformity and centralized authority, and generally neglected to a shameful and often criminal degree.

I cannot now and here detail all this data—it would require a full day—so you must assume my position is right until you investigate directly.

This situation becomes more burdensome every day and it is unthinkable that we cannot as a nation control it, so we approach consideration of the solution of this Gordian knot.

The insurance organizations alone will never be able to give us relief, for reasons I will now develop.

NATIONAL BOARD OF FIRE UNDERWRITERS (N. Y. City)

The best known and most authoritative organization of the stock insurance companies (apart from the local underwriting boards, which are most in evidence in dealing with the public) is the National Board of Fire Undewriters, 135 William Street, New York City. It describes its own views and activity in its December, 1908, Conservation Address, as follows:

"The National Board of Fire Underwriters, which this Committee represents, devotes its energies and activities to the reduction of the fire waste and the safeguarding of life and property and has nothing to do with the rates of premium. It confines itself to matters in which fire insurance companies have a common interest and most of which also deeply concern the public.

Thus, through a Committee on Fire Prevention, commanding the services of a corps of engineers, the cities of the country are systematically inspected by the National Board of Fire Underwriters with a view of pointing out defects in water supplies and fire department equipments, and copies of these reports, with our recommendations for improvements, are presented for the free use of municipalities; an extensive laboratory plant is supported for the purpose of testing material and devices of a hazardous nature entering into the problems of fire protection; a model building code has been adopted, ten thousand copies of which have been distributed to cities and towns in the United States; an arson fund is subscribed from which over a million dollars in rewards has been offered for the conviction of incendiaries; nearly half a million of standard rules and lists of hazardous and protective devices and materials were during the past year alone circulated to the public free of charge; hundreds of thousands of copies of the rules to regulate electric installations are annually distributed, and in every way possible we have endeavored to create a sentiment which should tend to place some check upon the constantly increasing destruction of values by fire.

The Committee believes that the present fire waste in this country is an unnecessary national calamity, and that to reduce it it is essential

First—That the public should be brought to understand that property destroyed by fire is gone forever and is not replaced by the distribution of insurance which is a tax collected for the purpose.

Second—That the States severally establish and support the office of Fire Marshal and confer on the Fire Marshal by law the right to examine under oath and enter premises and to make arrests, making it the duty of such officer to examine into the cause and origin of all fires and when crime has been committed requiring the facts to be submitted to the Grand Jury or proper indicting body.

Third—That the States severally adopt and enforce a building code which shall require a high type of safe construction, essentially following the code of the National Board of Fire Underwriters (for use by municipalities).

As long ago as 1892 a Committee of this Board addressed the President of the United States on the destruction of life and property by fire. As was expected, it appeared to him a matter for State rather than National legislation.

Fourth—That municipalities adopt ordinances governing the use and keeping of explosives, especially inflammable commodities and other special hazards, such as electric wiring, the storing of refuse, waste, packing material, etc., in buildings, yards or areaways, and see to the enforcement of such ordinances.

> *Fifth*—That in all cities there be a paid, well disciplined, nonpolitical fire department, adequately equipped with modern apparatus.
>
> *Sixth*—That in all cities an adequate water system with proper distribution and pressure be installed and maintained. In the larger cities a separate high pressure water system for fire extinguishment is an absolute necessity, to diminish the extreme imminence of general conflagrations."

The National Board of Fire Underwriters, the highest authority in Stock Insurance, admits the ***inability of insurance interests alone*** to properly regulate fire waste in this country in the following language taken from its 1910 Conservation Address:

> "No one organization can effect the needed reform. Since 1880 the population has increased 73 per cent. while the fire loss for the same period increased 134 per cent. The National Fire Protection Association and the National Association of Credit Men are spreading the doctrine of reform in the recklessness with which our utilized resources are destroyed by fire. Each organization should be encouraged. Membership in the former is open to all and in the latter to the business men and merchants of our cities.
>
> The work, however, is carried on without State or municipal coöperation and therein lies the chief reason of delayed success.
>
> If the office of State Fire Marshal were created by every Commonwealth, and that official and his deputies given power to enforce good fire prevention laws, investigate and if necessary prosecute cases of arson or criminal carelessness in the starting or spreading of fires; ascertain the cause of every fire, and by the distribution of literature educate the citizens to the need of care and forethought in the protection of his property, a distinct conserving of the utilized resources in that State would follow:
>
> If our municipalities will enact and enforce improved and safe methods of building construction and cause the removal or reconstruction of existing structures which constitute—because of their construction—a menace to adjoining properties, our cities will be freer from the imminent conflagration which now threatens them. Eliminate defective chimney flues, unprotected external and internal openings, excessive areas, weak walls and combustible roofs; prohibit the storage of rubbish and demand the safe use and handling of dangerously inflammable liquids and oils; regulate the use of explosives;—and the destruction of our values, created from the natural resources but enriched many fold by human toil, industry and skill, will be materially diminished.
>
> If the citizens of a community, as members of their local civic bodies and boards of trade will create in such organizations a Committee of Fire Prevention, whose duty it shall be to study the subject and awaken among their associates a realization of individual and communal responsibility, and if our Boards of Education will emulate the action of the State of Ohio in prescribing primal education of the school children as to the chemistry of fire, the causes of fires in our homes, and how to guard against them, and how to extinguish incipient fires or hold them in check while awaiting the response of

> the fire department, a preparation will be made in that community which will check the constantly increasing fire waste."

This Board in its 1911 Conservation Address specifically invites commercial bodies and Boards of Trade of our cities to interest themselves in this subject of fire waste, and urges upon our Governors and State Fire Marshals to set aside a Fire Prevention Day and take every other possible step to teach the people at large, including factory workers and school children, the danger of fire and how to minimize, suppress and evade it, in the following language:

> "Many commercial bodies and boards of trade of our cities have taken up the subject of the fire waste, appointed local committees on Fire Prevention and advocated and secured improvements tending to afford better fire protection and lessen the great financial drain which the fire loss was causing in their communities.
>
> The National Association of Credit Men, which has perhaps devoted more time to the study of insurance and the fire waste of the country than any other commercial body, has been very active in acquainting business men with the importance of the subject and in encouraging the adoption by State and municipality of such remedial measures as will tend to diminish the steadily and rapidly increasing fire losses.
>
> The States of Ohio, Montana, Nebraska and Iowa are instructing their school children as to the importance of observing greater care in the handling and use of the ordinary fire hazards. The Fire Insurance Commissioners in annual convention in August last adopted the following resolutions:
>
> The appalling annual loss of life and property in the United States by fires, due to criminal carelessness, ignorance or dishonesty, command the serious attention of the American people. From present indications over $300,000,000 in property values will be utterly wiped out during the current year—a sum so vast that it must have a serious economic effect on the prosperity of the country. The causes for this enormous drain on the savings of the nation are well known and to a large extent preventable.
>
> The destruction of property by fire is ten times as great per capita in the United States as it is in Germany, France, England and other countries abroad; and in addition to this needless waste of property there are also thousands of men, women and children burned to death or crippled in the various local fires and conflagrations that constantly occur. The chief factor responsible for this situation is general carelessness and the utter lack of personal responsibility for the removal of causes productive of fires.
>
> We recommend a campaign of education through the Governors, Insurance Commissioners, and Fire Marshals of the various States, for the purpose of bringing directly to the attention of the people the causes responsible for the national ash heap, and the adoption of legislation which will safeguard the lives and property of the people by holding every individual responsible for carelessness resulting in fires.

> We recommend the suggestion unanimously adopted by the Association of Fire Marshals of North America, urging that Governors of the various States set aside one day each year to be known as "Fire Prevention Day." By proclamation the Governor can call the attention of the citizens to the enormous preventable fire waste of the country, and urge the taking of such precautions—individual, municipal and State—as will tend to reduce it. Appropriate exercises can be held in the public schools, instruction on the common fire hazards can be given the children, and the day can be made the occasion of the "clean-up day" which is doing so much to remove hazardous conditions.
>
> *Resolved,* That the individual members of the convention will use their influence to secure such action by the Governors of their respective States, as an important, practical and educational assistance in the work of fire prevention.
>
> The Governors of a number of our Commonwealths have already acted favorably on part of the foregoing suggestions and by proclamation have set aside a day to be known as "Fire Prevention Day," when the citizens will be called upon to ***clean up their several premises*** and provide better fire protection, as a part of a nationwide study of fire waste, and ***the individual responsibility of property owners and householders.***
>
> The State Fire Marshals in their annual session adopted somewhat similar resolutions. The awakening of our people on this subject affords encouragement, but as yet it is only partial, incomplete, and not in keeping with the national importance of the subject.

The present Secretary of the Department of the Interior of the United States, Hon. Walter L. Fisher, at the annual meeting of the National Fire Protection Association in New York, May last, raised his voice on this subject as follows:

> "To arouse the people against the fire foe is our task. If there were any dispute as to the facts, if any one opposed a movement to check the fire loss, the American people might more readily become partisans of this movement which you are leading. But there is no difference of opinion regarding the essentials. The average American citizen would admit that our fire waste is in the nature of a national disgrace. The task is to make him do something to remedy conditions. You must popularize your movement and create a general demand for adequate laws and thorough enforcement. To relieve the people of the unnecessary burden which they are now carrying you must teach them the importance and the significance of that burden. You must show them the necessity for a defence against this common enemy. Organized methods must be adopted for bringing the significance of the fire waste before every person who will read the written work or listen to the spoken one. Let the people once realize the exact facts of their own negligence and they will be swift to provide the remedy."

In testimony on the same point I further quote Mr. A. F. Dean, one of the best-known underwriting experts of the stock insurance organization:

> "The difference between our country and Europe seems to be that we are lavish in extinguishing fires and niggardly in preventing them. A fire department appeals to our love for the dramatic, but it is *complicated, costly* and *only too often absurdly inefficient*. On the other hand, *fire prevention with its unbounded scope for efficiency, is simple and relatively inexpensive*—but it is prosaic and commonplace, with wide intervals of time between cause and effect, and such things do not appeal to our national temperament, which looks for immediate results."

It must be admitted from the above that something besides insurance organizations and firemen must get to work in a thoroughly uniform, practical and organized manner all over the country if American fire waste is to be controlled.

The technical and practical experience on the subject in all phases —constructing, protecting and occupying property—is now thoroughly known to the expert branches of the insurance organizations (in which are combined both the stock and mutual companies) and no agency in the country can either increase or perpetuate this expert information so well as the insurance organizations; hence, whatever further movement is undertaken and followed with a view to reducing our national fire waste, this part of the work should always rest where it now is.

The branches of the insurance organization which carry on the technical part of this work are the National Fire Protection Association (87 Milk street, Boston, Mass.) and the Underwriters' Laboratories, Inc. (207 East Ohio street, Chicago, Ill.).

NATIONAL FIRE PREVENTION ASSOCIATION (Boston)

The following data from the N. F. P. A. Year Book, 1911, will explain the scope and method of their work:

> The objects of this Association are to promote the science and improve the methods of fire protection; to obtain and circulate information on these subjects and to secure the coöperation of its members in establishing proper safeguards against loss of life and property by fire.
>
> Its membership consists of
>
> (a) Active Members (National Institutes, Societies and Associations interested in the protection of life and property against loss by fire; State Associations whose principal object is the reduction of fire waste; Insurance Boards and Insurance Associations having primary jurisdiction)—Annual Dues, $15.00.
>
> (b) Associate Members (National, State and Municipal Departments and Bureaus; Boards of Trade, Chambers of Commerce and similar business men's associations; Insurance Boards and Insurance Associations not eligible for active membership; individual members of organizations represented in the Active or Associate Members; individuals engaged in the fire insurance business)—Annual Dues, $5.00.
>
> (c) Subscribing Members (Individuals, Firms and Corporations interested in the protection of life and property against loss by fire). Annual Dues—$5.00.

The active members of this Association include all the Stock and Mutual local Underwriting Boards throughout the United States and Canada, and a large number of important Associations—national in scope—which have expressed their interest in fire prevention and protection through appropriate resolutions and by the formation of committees, to advance the purpose of such resolutions by acquiring active and associate membership in the N. F. P. A.

Notable among such business and commercial associations are:
The American Institute of Architects,
American Electric Railway Association,
American Institute of Electrical Engineers,
American Waterworks Association,
National Association of Credit Men,
National Association of Manufacturers,
National Hardware Association,
National Association of Sheet Metal Contractors of the United States, and others too numerous to mention.

I am or have been Chairman of the Fire Prevention Committees of the last four named Associations, and induced three of them to join the N. F. P. A.

The National Board of Trade, the National Organization of Chambers of Commerce, the Municipal League, and The American Bankers Association should undoubtedly become active members in the N. F. P. A. and induce their constituent bodies to become associate members, thus disseminating throughout these important trade bodies the regularly distributed literature of the N. F. P. A.

Mr. W. H. Merrill, president of the association, at the fifteenth annual meeting, May 23d last, in New York City, reviewed its work, which included the following statements:

> "It is well that during 15 years we have proven in practice the soundness of our recommendations, for proven facts are demanded and being utilized to-day as never before.
>
> Formulated largely by men whose daily avocation is the analysis of fire risks, having in consultation with them representatives of all the interests involved and furnished with data on details by thorough and competent laboratory experimentation, it was reasonable to suppose that our specifications would successfully meet the requirements of practice; but it is comfortable to feel that such is the case and that we are not theorizing in the recommendations we make for safeguarding the lives and property of our fellows.
>
> We prescribe real buildings of fireproof construction (not shells with unprotected vertical and horizontal openings, and finished or equipped with combustibles), real fire windows (not merely things of glass and metal); real fire doors with fire (not ordinary) door hardware; real automatic sprinkler installations (not partial or ineffective equipments or perforated pipes); real fire hose (not the common, shoddy substitute); real first aid appliances (not those which require fires educated to meet their limitations); real structural methods and materials; real fire-fighting apparatus—and so on through the whole field of fire protection.

> Of special and miscellaneous subjects, our reports, pamphlets and papers, cover thousands of items, information from which has been freely distributed wherever the need for it was apparent.
>
> The admirable articles and editorials in our quarterly magazine are also widely quoted and copied, many of them attracting attention in one form or another during periods of a year or more after their publication by us. Specifications which we have prepared, adopted and recommended have run through many editions, hundreds of thousands of copies have been distributed, and their provisions are found embodied in many laws, rules and contracts relating to the various subjects which they specifically cover.
>
> The N. F. P. A. extends its welcome to each passerby who may express an interest in fire prevention or protection. He may join the effort for the general good which has been crystallized and is being carried forward through the constantly broadening influence and work of this association. Each one may obtain for himself through this agency information and advice on matters of fire protection engineering from experts trained in this profession, and at the same time add his helping hand and the moral influence of his membership to the effort of the trousands of loyal soldiers already enlisted and doing brave battle against the evil spirits of the flame."

UNDERWRITERS' LABORATORIES, INC. (Chicago)

As regards the Underwriters' Laboratories, Inc., this is a purely technical establishment (under the direction of the National Board of Fire Underwriters) which was chartered by the State of Illinois, November, 1901:

> To establish and maintain laboratories for the examination and testing of appliances and devices, and to enter into contracts with the owners and manufacturers of such appliances and devices respecting the recommendation thereof to insurance organizations.
>
> The work of the Underwriters' Laboratories is confined to investigations having a bearing upon the fire hazard, and is undertaken as one means of securing correct solutions of many of the problems presented by the enormous and disproportionate destruction by fires of property in the United States."
>
> The object of the Underwriters' Laboratories is to bring to the user the one best obtainable opinion on the merits or demerits of appliances in respect to the fire hazard. Such appliances include those designed to aid in extinguishing fires, such as automatic sprinklers, pumps, hand fire appliances, hose, hydrants, nozzles, valves, etc.; materials and devices designed to retard the spread of fire, such as structural methods and materials, fire doors and shutters, fire windows, etc.; and machines and fittings which may be instrumental in causing a fire, such as gas and oil appliances, electrical fittings, chemicals and the various machines and appurtenances used in lighting and heating.
>
> Summaries of the Laboratories' reports are promulgated on printed cards, filed according to classifications. Cabinets containing these cards are maintained at the offices of the principal boards of

underwriters and inspection bureaus in the United States, at many of the general offices of insurance companies, by some insurance firms, certain municipal departments and at the local offices of the Laboratories in larger cities. Much of the information is also freely distributed by means of lists of approved and permitted devices promulgated freely on request by the National Board of Fire Underwriters, 207 East Ohio street, Chicago, Ill.

The results of the work in many classes of appliances are furnished directly to building owners, architects, users and all persons interested, by means of the Laboratories' labeling system, under which goods are inspected at factories by Laboratories' engineers and stamps or labels attached to such portions of the output as is found constructed in accordance with the standard requirements.

The aim of the founders of the Underwriters' Laboratories—which was to secure the best and fairest opinion regarding the merits or demerits of every device, system or material having a bearing upon the fire hazard, and to have the work so conducted and reviewed as to secure accuracy and uniformity in its findings—has been accomplished to such an extent that the majority of fire underwriters in the United States, many municipal authorities, and a large number of architects, building owners and users either accept or require a report from these Laboratories incident to their recognition of devices, systems and materials having a bearing upon the fire hazard.

Underwriters' Laboratories, Inc., however, issues no guaranty that its finding will be accepted or recognized in any case. Such assurances can only be obtained from the authority having jurisdiction. (Such as the Philadelphia Fire Underwriters' Association.)

The Underwriters' Laboratories, Inc., have thoroughly studied, tested, standardized and issued data in circular form on:

Complete Building Construction,
Automatic Sprinkler Machinery and Equipment,
Fire Pumps,
Skylights,
Liquid Fuel, storage and machinery,
Municipal Fire Alarms and Signaling Systems,
Railway Car Plants,
Wireglass Windows,
Waste Receptacles,
Public and Private Fire Department Valves and Hydrants,
Kerosene Oil Storage Systems,
Protection against Lightning,
Heating, Cooking and Welding Apparatus,
Fire Doors and Shutters,
Electric Wiring Apparatus,
and other subjects too numerous to mention.

There is no question but that the technical information and experience collected for a century by the Insurance organization is ample to guide the public in reducing the fire danger if they would only understand and use it.

The very extent and accuracy of insurance knowledge on this subject, however, lays this interest open to suspicion on the part of the public, who generally feel that they are bound to get the worst of the bargain in any dealings or disputes.

The insurance world therefore ***greatly needs an intelligent organization of the business interests of the country to parallel their efforts in fighting fire waste,*** which can at the same time set them right with the public or show them where they are wrong from place to place and time to time. The public needs such a business men's and property owners' organization to fight fire waste, to study, formulate and get enacted and enforced a rounded program of uniform legislation throughout the States and municipalities within the States—covering a standard insurance policy, brokers' license, fire marshal law and building ordinance—all under centralized, thorough, honest, capable and continuous inspection service.

Included in such legislation should be continuous public distribution of knowledge about this common danger to property owners generally and factory workers and children in school—including the building and protection of new property and improvement of old property; cleanly housekeeping; fire drills in schools and factories; and the many small causes of fire, such as defective flues, bad matches, accumulated rubbish, etc., etc.

Finally, in all such legislation an avenue should be opened for volunteers to work—just as they now work in the Society for Prevention of Cruelty to Animals. A principal function of the business men's organization in this work should be to inspire, inform and organize volunteers all over the country to watch, stimulate and assist officials to enforce fire-waste laws.

If the necessity for such legislation is admitted, is it not necessary for those most needing it to make practical plans to formulate it, procure it and enforce it? The public must do this through some channel, as others interested need not and will not.

The Illinois State Commission on this subject calls attention to—

> "The fact that it is no more the moral duty of fire insurance to teach the public how to reduce fire waste and thereby cut down the income of the industry than it is for doctors to teach people how to keep healthy, or for lawyers to teach people how to avoid litigation, and frankly admits that fire indemnity has done its whole duty in the face of widespread misunderstanding and misrepresentation of motives that cannot be called fair," stating that it would be dishonest to withold this plain statement of the truth.

This last and what immediately follows is from an address by Mr. Dean:

> "Fire Underwriters have long tried to educate the public into an understanding of the nature and equities of their industry, with indifferent success. This has largely been due perhaps to the fact that Underwriters themselves have been confronted with some of the profoundest problems of modern life; that—as in every other form of activity where students are few—many of the results of their research have been in conflict with established prejudices or entrenched

> privilege. Again, the house of insurance is a divided house; its personnel is separated into groups with conflicting duties and interests. This industry has its commercial as well as its regulative or administrative side. On the commercial or business-getting side we find agents and brokers who are compensated by commissions. These commissions are part of the outgo of the industry which must be comprehended in the rate and paid by the assured. Stated briefly, the companies own the capital, while the agents and brokers own the business. A single agent may represent many companies. These companies are permitted to remain at the will of their host, and the most active phase of the competitive strife among companies is to secure the agent's favor. In many towns one or two agencies practically monopolize the business, and the companies are simply tenants at will, whose baggage may be set on the sidewalk any day by the landlord, who is not disposed to tolerate even the mildest criticism of his accommodations or the price of his board. Needless to say, the *buyers of insurance pay* for the service of agents."

You cannot therefore expect the insurance organization to care for the public interests as a matter of actual or moral right, as they see it; or from expediency, because they have many troubles at home.

They are conducting in the aggregate all of this work as a part of their commercial business of writing insurance on property for profit.

The general manager of the Scottish Union and National Insurance Company of Edinburgh is quoted in *Everybody's* as saying to a group of insurance experts at Glasgow, the following:

> "Were there no fires, there would be no insurance business, and, on the other hand, the greater the fire damage the greater the turnover out of which insurance companies make profit." And further: "Speaking to-night as manager of a fire insurance company, I say we cannot make profits for our shareholders without fires, and further, that within certain well-defined limits we welcome fires."

This may only represent a partial view of the insurance underwriters, but there are not a few managers in this country who frankly hold the same opinion about their business or major interests. They tell their agents to take risks as presented on the schedules they prepare and they will chance the results, within the limit of amount they fix. So long as *they lose only half of their premium so collected* they seem to like the business and find it satisfactory in their profit.

Therefore the business interests of insurance underwriters at large, and the much vaunted influence of the elastic insurance schedule to reduce fire loss, do not appear so effective in fact as claimed.

Again assuming the insurance organization would undertake to formulate and prepare legislation actually required all over the country to suppress fire waste, would they not, naturally, as human things go, advise a program which would lean more to their interests in the matter than that of the public? Is it not essential that the public protect its own interest, directly, in such an important matter by an effective, uniform, centralized and widespread organization which it would *dominate* and not merely follow?

Therefore from any viewpoint of practical administration, I advocate, at this time, an organization of such bodies as you own all over the United States to undertake legislative and educational work to suppress fire waste; and which will coöperate with the insurance organization and their highly effective representation in legislative halls all over the country in bettering conditions so long as the interests of the public are fully conserved. In such a program and in the event of a divergence arising—which I, for one, do not believe would often occur—this business organization representing the major interest of the country should enforce, to the extent of its power, its program, although opposed.

The technique of the art should be left with the insurance organization. The business of accomplishing beneficient legislation, however, should be the burden on this business organization, because the insurance interests as a rule do not have easy sledding in legislatures, and their program is often subject to assault if only because advanced by them.

Every consideration shows the necessity of commercial bodies taking up this matter seriously and in detail at this time.

I will now illustrate the actual detail required to prepare and advance legislation.

Last winter in Pennsylvania the State Firemen's Association and the State Association of Mutual Insurance Companies started in to pass a State Fire Marshal law through the Pennsylvania Legislature. A study of two drafts of the law they had prepared disclosed possibilities of improvement, whereupon I engaged competent constitutional counsel and laid before him these drafts together with copies of various other fire marshal laws and a digest of laws relating to the subject in the State of Pennsylvania, and added to this data certain other suggestions on educational features and certain recommendations of the Legislative Investigating Committee of the State of New York.

A new draft was finally worked out in numerous conferences, which was finally accepted by the above-mentioned associations and was then submitted to the Pennsylvania State Fire Insurance and Educational Departments for their approval. These drafts were also submitted to the stock and mutual insurance interests for discussion and approval. I then invited representatives of various public commercial bodies in Philadelphia to a meeting at the Bourse, at which time the whole matter was laid before them in detail, orally and by a printed pamphlet.

The measure was so fair and complete as to gain widespread support. It then became necessary to appear before the committees of the Legislature—by resolution, by individual letters and by actual presence of the individuals—to impress on the lawmakers in person at the capitol the demand for this proposed law.

It finally passed in quite satisfactory shape and was signed by the Governor.

Consider for a moment the amount of work and legitimate expense that was required in this one instance.

Again, when the Legislative Investigating Committee was considering the subject of insurance in New York last winter, I made three trips to New York and was present at a meeting of the representatives of important trade bodies in that city, all with the object to inform, stimulate and influence that legislative committee to propose a fair and effective fire marshal law.

It was not possible to round up as much actual support and information at Albany as we later accomplished at Harrisburg, and hence the fire marshal law passed by the last New York Legislature, although a good one, is not so good as the Pennsylvania law.

Here again arose the actual necessity of engaging in the detail work and expense of a struggle—first, to prepare; second, to secure and convince the necessary support; and third, to actually get this support on the ground in order to get the law passed and signed by the Governor.

One or a few individuals are not called upon to continuously carry on such effort at such expense; it is the duty of the public at large to provide means to accomplish such ends.

The articles above stated, in *The Survey* and *McClure's Magazine,* and the *Journal of Commerce* clearly show the widespread confusion in the existing basic laws and ordinances, and the confusion and negligence in carrying out even such laws as there are under present conditions.

The old statutes and regulations of almost any State and city require study at this time; and in most cases should be rescinded and modern, complete regulations imposed in their stead; and these should be *uniform* as between State and State, and as far as possible uniform—except as limited by congestion—throughout the cities and towns of each State.

The stories of the Newark and Washington Place fires particularly show the imperative necessity of continuous, honest and intelligent inspection under *centralized* authority—preferably by the "Fire Department" and by the "Bureau of Building Permit and Inspection" service in cities, and by the "Factory Inspection" service throughout the State, and after that by any corps of volunteer forces which can be recruited from the insurance personnel and all other sources. Continuous inspection is essential for better conditions even with good laws. This inspection should be real, and of adequate quality and amount, to actually cover the ground.

Quoting further from *Everybody's*:

> "There are several people whose business it is to deal with the crooked fire and the crooked fire adjustment. In the Boroughs of Manhattan, the Bronx and Richmond, of New York City, there is a fire marshal who is supposed to investigate the origin of all fires and to prosecute incendiarism. He has eight assistants, an interpreter, a stenographer and a clerk. With that force the city of New York expects him to find out all about the origin of twelve thousand fires every year, gather evidence of crime and present it to the Grand Jury. Think of nine men trying to investigate the cause of a thousand fires a month, or two hundred and fifty fires a week. In ten years there has been no increase in the force whose business it is to investigate the cause of fires, although the number of fires has been more than doubled in that time. Yet in the same period the fire-extinguishing force has been increased over one hundred per cent. Could anything be less intelligent than that?"

Industrial Engineering, September, 1911, has an article on "Fire Protection in Factories" by Mr. S. G. Walker, of the Mutual Insurance Organization, which I quote as follows:

> "It is estimated that 60 per cent. of fires start from careless or preventable causes, and although it is clearly impossible to wholly eliminate these, good management goes far toward effecting a reduction. In the early days, with no protection which would be recognized as such to-day, it may be said to have been a matter of good luck reinforced by good management—or perhaps later, the reverse—that kept factory properties from burning.
>
> The success of the mutual fire insurance companies has been as much due to the *efficient inspection* of their risks as to any other one cause, for in the long run this was *bound to reduce losses.* This vigilance has not been in the least relaxed since the general introduction of modern fire-fighting apparatus *for if a fire can be prevented it does not need to be extinguished, and even a small loss is avoided.*
>
> The inspectors are most thorough, investigating and reporting upon, in minutest detail, anything which has a bearing on fire hazard. Heading the list of features is that of order and neatness, or housekeeping, and it frequently takes several years to get a new member up to the Mutual standards in this respect, but right here is the feature of carelessness sought out and corrected. All the physical characteristics of a property, affecting hazards or the extent of a probable fire loss, are examined and noted, covering such features as *construction, exposure, occupancy, heating, lighting, protection and management,* which are rated according to the judgment of the inspector.
>
> As a matter of fact the maintenance of this department represents about as much in outlay as the average losses amount to, under present-day conditions of protection, and, while the results cannot be reduced to dollars and cents, there is no question but that the fires prevented each year pay for the cost of maintenance of inspection service several times over.
>
> As recently as fifteen years ago it was thought logical to exercise some judgment as to where automatic sprinklers were necessary, but a few fires in places deemed immune demonstrated the fact that it is cheaper in the long run to buy protective apparatus than to pay for factories or parts of factories destroyed by fires starting unexpectedly and from unsuspected causes, and the present practice is to *protect* every locality where combustibles are involved either in buildings or contents.
>
> It is calculated from experience that automatic sprinklers will eliminate over ninety per cent. of the fire losses in a given factory during a period of years of sufficient length to establish average conditions.
>
> In view of the recent appalling loss of life in New York and Newark fires it may appropriately be noted that a sprinkler equipment serves as a most efficient life saver as well as protector of property, and had either of these buildings been equipped, the gruesome results would have been averted. The same may be said of

the Iroquois, Boyertown and Collinwood fires, and many others which stand forth prominently among the extended list of calamities of this kind in our country."

The article above, quoted in *McClures,* affords further evidence about the advantage to any existing building (not to speak of new buildings) of the modern automatic sprinkler system, and the writer also shows the imperative necessity of reasonable fire tower service for high and fully equipped buildings.

A further article in *The Survey* of June 7, 1911, by Mr. H. F. J. Porter, engineer, of New York, entitled "Warding Off the Factory Fire Panic and its Loss of Life," shows the imperative necessity of adequate fire escapes and fire drills in factories.

Every indication points to a dual duty of the trade associations of this country, viz: working with and getting technical knowledge and experience from the fire insurance organization through the channel of membership in the N. F. P. A., on one hand, and on the other hand forming a *National league* with State branches and town and city sub-branches among themselves, which will be dominated by themselves, to fight fire waste.

The insurance organization should be invited into this new trade association to fight fire, but should not in any case exceed more than 25 per cent. control directly or indirectly. Rough figures obtainable from government statistics show that there are approximately 9000 trade associations in 4500 cities and towns in this country, and approximately 13,000 agricultural organizations in approximately 10,000 towns and villages in this country. This gives abundant material with which to work out this plan.

I have been committed to such a purpose in principle for now about five years and the time is ripe to carry it into effect.

It is time for us to stop this waste in life and property, and the way to stop it is *to stop it!* The first effort must be to find out who will assist in this work by raising the point in an entirely impersonal way, so well illustrated by my formerly-quoted friend, Mr. Dean:

> A visitor once asked the janitor in a lunatic asylum, "How do you tell when the patients are insane?" The answer was: "I turns on the water in the basement and sets 'em to moppin' up the floors; them as ain't idjits shuts off the water."
>
> We have many water faucets running in our national basement and have apparently just bethought ourselves of the advisability of shutting them off. With our tendency to invent a name for everything, we have grouped the aggregate flow from these faucets under the expressive term "National Waste," and of all these faucets that have been deluging our basement, easily the first in volume is fire waste.

POWELL EVANS
Chairman, Fire Prevention Committee Philadelphia
Bureau Municipal Research
Chairman, Fire Prevention and Insurance Committees:
National Hardware Association
National Association Sheet Metal Contractors
Former Chairman, like Committees:
National Association of Credit Men
National Association of Manufacturers of the United States

(2) SOME TECHNIQUE OF FIRE WASTE CONTROL

An Address Before the Boston Society of Architects, Boston, Mass., Feb. 16, 1912

REPEATED IN PART BEFORE THE PENNSYLVANIA STATE ASSOCIATION OF AMERICAN INSTITUTE OF ARCHITECTS AT THEIR ANNUAL MEETING, PHILADELPHIA, APRIL 9, 1912

Mr. President and Gentlemen:

It is a distinct compliment to be asked to speak to this Society on Fire Prevention and Protection, particularly in view of the active interest in these questions in this city at this time.

An early engineering training supplemented by later special experience in the manufacture and distribution of fire prevention and protection apparatus have brought me into close contact with the technical bureaus of the insurance world during the past ten years. During the past five years particularly I have appreciated forcibly the serious and far-reaching economic drain on this country caused by our largely reducible fire waste, and have carefully studied the subject here and abroad with a wider view and deeper sympathy than that engendered by merely personal interest. I look upon architects and engineers as experts in this matter particularly "Down East" and in Boston. Here is a center of high stock fire insurance standard and precedent, and the home of the mutual fire insurance system, our best exemplars in this work.

I venture to ask this question: Does your profession, speaking of the country at large, lay sufficient emphasis upon fire prevention in your work, or do your clients, or the public generally? Any informed man would have to answer in the negative. There is certainly enough authoritative data on the subject, but it is not used. A wave of public interest has begun to move across the land demanding correction of current fire waste, and it is now possible to accomplish reforms which even a few years ago would have been thought chimerical and almost impossible.

A reasonable minimum of fire prevention and protection should almost subconsciously run through all new building design, and all change and all improvement of old buildings, touching strength and character of materials (especially with reference to the occupancy hazard, even when on fire), vertical openings, concealed spaces, etc., etc., to the end of the physical chapter.

In machine design for instance—of which I have experience in the manufacture of motor car parts—even the draughtsmen are taught the rudiments of selectable materials (so that a casting or forging, or pressed steel part may be appropriately employed) and of pattern making (so that unnecessarily expensive forms may be avoided), and of machine tool practice (so that the finished part may be economically produced).

In this way a harmonious and well designed assembly may be accomplished without any sacrifice to its final use, while still safeguarding the best practice in form and cost with respect to its parts.

This nearly automatic care for fundamental essentials in daily work may be seen from another angle of view in ordinary corporation practice where good law runs through all contracts no matter how small or temporary. If a transient wire or pipe is to be taken across a railroad right-of-way, the physical facts are advised as a matter of course to the legal department for wording of the contract.

Nothing is in the end more confusing than doing a complex thing informally, hence systematic and nearly automatic provision could with advantage to all concerned be thrown around all your work, especially in the preparation of your specifications, touching this important matter of the control of fire danger throughout all structures under your direction.

Provision for fire control should and could be incorporated in all building construction—from its commencement in your office up to the completed structure—and without undue cost or trouble, if your system of work anticipates it, learns it, and enforces it as a matter of course.

Many of you doubtless do not need this suggestion, but what about your clients? Ignorance, indifference and self-interest often control the investor. No one could object to a man operating a powder mill in a celluloid building—if he goes far enough away and by himself. When his actions affect others, however, social control should take command and enact and enforce minimum requirement laws, to the end that the greatest good for the greatest number may be conserved. No man may directly commit murder or destroy the property of others, no matter how much inclined or to his interest, and equally no man should be permitted to do either of these things indirectly by needlessly causing or allowing a dangerous fire.

In populous areas paving, sewers, lights and police are the present day rule of civilization, no matter if they do cost, and we are taxed accordingly. Why then should the pest of fire danger to life and property be sidestepped for years because it costs somebody something?

Since the fabled Prometheus first brought fire to man it has been at once his greatest intimate of the elements, his greatest friend and enemy—the *control* measuring this relation.

In every building throughout the land, in every life, everywhere and most of the time, we use fire in many forms. We should *control it as widely,* but have failed to realize and accomplish this truth.

The annual and increasing fire tax in this country exceeds its just amount by fully $150,000,000, 1000 deaths, 4000 bad accidents, and countless cost in sickness and nervous suffering, great loss of wages and interruption of business—all apart from the high related cost of insurance expenses and city fire protection and fire departments.

We are a great, big nation; and beat Europe in all this about ten to one.

This absolute financial loss we pay patiently and continually in great part as insurance premiums; and here again we beat Europe many times. We are too rich and busy as a nation to think this over and amend it. We live high and complain of the high cost of living—but the world looks on and calls us a thriftless lot. We have grown callous to this "old man of the sea" of fire waste, and have scarcely considered or resented his long, palsying grip.

There are no better friends of humanity and patriots than those who cry out long, loud, and successfully in this country against the continuation of this enormous and largely useless loss of life and property.

Most of this waste occurs in our large towns and cities, and in their congested central areas.

Analyze this fact, and you will find the *small town* and *suburb to-day* is the *city* of *to-morrow*. Many complacent Americans say this matter is too large and deep for correction within a generation. Then why do we not now reasonably digest this view in part and so build that the future fire danger shall decline to its just proportions and stay there —as European cities in the great majority now do?

It is hard to get the *idea* of *fire prevention* into the mind of Americans.

Commercial associations still insist on forming fire insurance committees (often to fight insurance rates), instead of *fire prevention* committees to reduce fire waste and so automatically lower the cost of insurance.

I am persuaded that those who design and construct buildings are not as fully alive to, and active in, this problem as they reasonably should be; and that even if they were, their influence is limited. Further, that building owners and occupants will not of their own motion travel far or fast enough to give proper relief; and, further, that the insurance world as a whole will not materially pass the limits of their own self-interest in curbing the evil, and are powerless to a degree if they would.

My reasons for this view cannot be fully detailed here for lack of time, but were given in an address last November before the Board of Trade of Camden, N. J.

There is no question but that the *technical* information and experience collected for a century by the insurance organization is ample to guide the public in reducing the fire danger if the public would only understand and use it.

This remark applies to the engineering side of insurance work. In the commercial underwriting, or commanding interest, however, there is naturally an effort on the part of underwriters to make their business pay the highest return.

The insurance *organization* over the country, as I see it, is too large for a personal view. It is a mighty *influence* that will always continue and must be counted in any calculation in this matter.

Any fair man who knows any number of its personnel must like and respect them in every way—although possibly at times diverging from their view and interest.

Yet the size, mystery and solidity of this body, added to their sure knowledge, makes them feared and suspected by a large proportion of the public and often by legislators, who feel they are apt to get the worst of any joint bargain. In technical standards, and detail State fire prevention associations, they naturally do and will continue to lead. In legislation and public education the business men of the country must at this time come together and get actively to work to suppress fire waste.

Now, having indicated the reason you should enter this work in a larger way, I would suggest some of the actual things to be done.

You have already in this city made admirable studies of your fire danger situation in your "Report of Commission appointed by the Mayor, August 23, 1911," and in your "Report of the Committee on Fire Prevention of the Chamber of Commerce, September, 1911," and finally, in the "Review of the City Club, December 7, 1911."

Internal evidence of some of these shows full confidence in their insurance advisers. I would suggest that you collect at the same time all further facts and views obtainable so that no one influence will weigh too heavily in your final actions in this city.

Mr. Clarence H. Blackall, chairman of your Chamber of Commerce Committee, was evidently of the same opinion when talking to the City Club, as the following will show:

> "Something like two years ago the Chamber of Commerce awoke—I don't know for the first time, but certainly did then—to the fact that because of the high premiums paid to the insurance companies there must be some way to save some money for the poor merchants who had little left after they paid their insurance bills. So they appointed a committee on insurance with the avowed intention of reducing the insurance rates. We met and began by talking to the insurance people.
>
> There was not a single insurance man on our committee, I am glad to say, so we could talk with perfect freedom among ourselves and call in all the experts we desired from outside. We talked with the leading experts here, and the representatives of the National Board of Underwriters, and tried to find out what the condition was. We very soon changed the name of our committee. We ceased to be the Committee of Fire Insurance and became the Committee of Fire Prevention, which is a very different thing."

Your efforts almost necessarily must lead to betterment in two important respects:

(1) Physical improvement of fire hazard in the community, and

(2) Moral improvement of fire hazard in the community.

The first item covers the definition of your widest (or city limits) with a mandatory minimum of requirements for (a) new building, (b) improvement of old buildings, and (c) forced retroactive correction to a reasonable extent of all buildings now dangerous.

Like definitions must then be made of your narrower (fire limits) area, with stricter regulation; and finally of your central (or congested) area, with the strictest regulation.

This requires full discussion and final compromise on your whole *area limit* legislation, and of the *building code* applied thereto—a large job but a pressing one.

No one posted in this matter can deny but that every State and city in the country, almost without exception, imperatively needs a new building code, and it does little good in any one section of the country to have one without the other. They should supplement each other so that the whole area of each State in time will be under control of either the city or State code. Witness the remarks of one of your own citizens on this subject, Hon. Edward Seaver, before your City Club:

> "Now if the measure proposed by the Chamber of Commerce to ward off a proposed conflagration in Boston is opportune and desirable, why is not its application to the entire metropolitan district equally opportune and desirable? We are all in one boat so far as needs common to all the people in the metropolitan district are concerned. If the common needs of water, sewers, and parks have been recognized and treated as common needs, the conflagration peril is a common danger and should be treated as a metropolitan question. It will be remembered that Boston narrowly escaped from the late Chelsea disaster.
>
> If it be contended that the proposed action must be taken sometime, and it might as well be now, the same is equally true of the metropolitan district, which cannot properly be dissociated from Boston where there is a need or danger common to all. A question such as this, going beyond the limited confines of Boston, might better be treated broadly to cover the whole field of danger instead of a part.
>
> Our committee was inclined to think that the regulation of all building construction throughout the metropolitan district is a desirable common need. Building laws, not limited to Boston alone, but covering the development of the entire metropolitan district as a recognized single community in essence, would inspire a more orderly march of progress and work for the common good. Such action will have to be taken sometime and it might as well be now."

Your Chamber of Commerce studies of building costs seem to point unanswerably almost to the exclusion of wood in roofs and walls anywhere except in real and lasting country areas; and your city committee is wise in endorsing so pointedly this view, particularly in recommending non-inflammable roofs—all, even to the discomfort of the lumber trust and the speculative builder and selfish tenement landlord.

As to the protection of buildings, it is not enough that a building should of itself be fireproof, but it should contain proper aids to protect its contents in life and property. The Chamber of Commerce of Rochester, N. Y., in its pamphlet, "Prevention of Fire, 1911," clearly brings up this issue in the following statements:

> "In Rochester our fire fighters reach a fire in the business section from two to three minutes after the alarm is received, and in the residence section from three to four minutes. It must be evident to the most critical that the cities of the United States are doing their duty through and with the fire departments (*Sic*).
>
> It seems to be granted that all fires are the same size when they start, but between the time of discovery of the fire and the arrival of the fire fighters, five minutes must elapse. That particular five minutes is the vital time in the life of the fire, the time when it gains sufficient foothold to become a dangerous blaze.
>
> The fire marshal of the city of Rochester is of the opinion that a certain building should have a fire escape on it. The superintendent of that building says that it is all nonsense, that the building is fireproof. Buildings may be fireproof—what about

the people? Experience teaches that there is enough inflammable in a fireproof building to keep a full head of steam on a boat like the *Lusitania* for twenty-four hours. Time and again fireproof buildings have withstood the fire, but the people inside of them have perished. Shouldn't we make an end of this freedom of opinion that costs so many lives?

The State capitol at Albany, New York, has just burned. The financial loss is six million dollars. The loss of documents and records is priceless. Here are the exact words of a man who was in the building when the fire started: "THE FIRE AT THIS TIME COULD HAVE BEEN EASILY PUT OUT WITH A PAIL OR TWO OF WATER. WE SEARCHED IN VAIN FOR ANYTHING TO SERVE THE PURPOSE. THE NIGHT WATCHMAN RAN DOWNSTAIRS TO SOUND THE ALARM, THERE BEING NO ALARMS IN THE BUILDING. WHILE WE WAITED FOR THE DEPARTMENT—" This building at Albany cost twenty-seven million dollars, and was not equipped with fire alarms, chemical extinguishers, or even pails of water, and we have the testimony of an eye-witness that this fire was a small blaze when it started.

There is too much confidence placed in "fireproof" buildings—*a furnace is fireproof* exactly the same as a building is fireproof, and the contents of a furnace will burn exactly as the contents of a fireproof building burn. The building in New York was fireproof. The State capitol at Albany was fireproof. The Cincinnati Chamber of Commerce was fireproof, and, in each case, everything inside the building has gone—burned out. Do not make a fetich of the word "fireproof." A powder factory might be fireproof."

I favor the extensive use of automatic sprinkler installations in most city buildings in congested areas on conviction, even if the city or State makes the devices and pays for them out of the tax rate and distributes them gratis to citizens. Your chamber of commerce study of sprinkler installation confirms all former knowledge and experience as to the reasonable cost and thorough merit of this fire protection.

Your proposed law for a bureau of fire incorporating certain sprinkler protection, endorsed by your city committee and chamber of commerce, is in line with the present New York City regulations and practice in this particular and with the proposed Chicago ordinance.

An important consideration enters here, however, with respect to the mandatory standard required.

As you adopt any economic utility and force its wide use by law you should protect the public against undue cost from any cause. I believe the present underwriters' standards (incorporated in most existing and proposed legislation on this subject) on *sprinkler installations* (not devices) is higher than proved averages demand. For years—all over the country—*less than ten sprinkler heads* have *controlled fully 90 per cent. of fires* originating under their protection.

Yet the underwriters' standards of pipe schedules, tanks, pumps, etc., have been carried up to sizes which would supply water to 50 per cent. of all heads which could open in any area. Hence, a material increase in cost of any system over that necessary to care for ten heads or less—or 90 per cent. of fires—solely to insure a minimum insurance loss on the remaining 10 per cent. of fires under such conditions.

This matter has been the cause of endless discussion among underwriters themselves for years, and at this time they are by no means a unit on existing rules. I know of cases where the sprinkler head and pipe system proper has been less than half the total cost—the major part of the total being bulk piping and adjuncts. To care for 90 per cent. of recorded sprinkler fires no system needs larger than 4-inch pipe anywhere, and tanks and pumps less than half present requirements.

Further — present underwriters' rules permit nothing less than 4-inch connections to public water supplies, hence connections to high pressure city service in numbers are dangerous, because one such broken connection may disable the entire high pressure system, yet 1-inch connections (each provided with properly worked out pressure regulator and strainer combined to limit pressure and assure flow through this smaller channel) would feed the 90 per cent. average of sprinkler heads that open in fires, and this rule would so reduce the danger of interruption of the high pressure service through breakage or leakage of such connection as to be reasonably safe and hence advisable.

You should investigate the above view carefully before reading the present underwriters' requirements into such an important law. You must also train firemen to understand the use of sprinkler outlets in buildings (demanded by underwriters for all city installations), which, in most cities throughout the country except St. Louis, are rarely used, and in Philadelphia are not used at all.

The demand for modern fire engine equipment is sound, yet I trust the day will come when American municipalities will—as has long since been the rule in Europe—rely more on the resistance of property itself than on many men and powerful engines pumping tons of spray haphazard into building interiors to reduce fire waste.

The necessity of prompt notification of any fire to the central city bureau and the immediate despatch thereafter of fire fighting apparatus, as emphasized by your city commission, is almost self-evident, and every city in this country must bring its alarm system up to a modern and efficient service.

Physical considerations having been considered, some emphasis in conclusion may be laid on (2) moral considerations.

Closely related to the above discussed physical questions are the moral ones of occupancy, housekeeping or management, and organized inspection under minimum requirement laws and ordinances to insure proper conditions in these respects.

"Occupancy" means the nature of the business conducted in any building, which must determine, first, the specification of the building itself for normal use as well as in the event of fire (because it considers not only strength of materials for use intended, but also in the event of fire); and as well determines many other factors of construction and protection, having regard for the particular trade housed and the way it is actually conducted; hence, at least in central city districts, buildings from their inception to their destruction should be licensed *continually, annually at least,* for occupancy. When a building is constructed for any purpose it should be licensed for that purpose at least annually both as to persons, pursuits and property housed.

If the use of any building is changed it should be reinspected and relicensed, incorporating mandatory fresh conditions precedent to any new use. I am not yet clear as to the desirability and practicability of your city commission proposal to impose license fees on trades likely to cause fires.

This subject is apart from that of "housekeeping" called "management" (by mutual insurance companies) or the continuous daily conduct of any given pursuit. As most fires originate from bad management or dirty housekeeping, it is apparent that this cause should be diminished as much as possible through the control of minimum regulation and the enforcement thereof by competent inspection.

Every little effort helps as a matter of course throughout this work, but the average betterment will not come over the country at large until average control of building occupancy and housekeeping conditions are incorporated in the fundamental law throughout American cities and municipalities and continuously enforced for a number of years.

The suggestion of your Chamber of Commerce of denying insurance on buildings and contents until they had been approved by your proposed fire bureau impresses me as a mischievous and even dangerous legislation, for reasons fully set forth in my address before the Fire Underwriters' Association of the Northwest, in the Fall of 1911 (page 153 herein).

Let insurance issue freely in honest amounts. To restrict it will surely affect Boston's credit. Your city commission recommends very clearly and wisely:

> "To decrease the possibility of fires from carelessness or evasion of the laws and ordinances, (a) The immediate codification of all laws and ordinances relating to the prevention of and protection from fire and the protection of human life from fire and explosives with a view to the amendment of such laws that the enforcing power shall lie in one central body."

Its explanation of this recommendation is so clear and forceful as to bear repetition here, viz:

> "At the present time the enforcement of laws and ordinances relating to the protection of life and property from fire and explosives is scattered through many departments of the State and city. Permits for the transportation, sale, use or storage of one kind of explosives are issued from one office, for another kind from another office, while licenses to operate under the permits come from still other offices.
>
> In the last analysis the fire department is better qualified to pass on these matters and the most interested in the enforcement of laws and ordinances relating to them. We are of the opinion that

all such laws and ordinances should be codified and amended to the end that the fire department have entire control over the permits and licenses and the making of reasonable regulations for the transportation, sale, use or storage of explosives or highly inflammable substances; and initiatory power in the enforcement of laws, ordinances and regulations.

Reasonable fees may be charged for such licenses or permits and similar licenses or permits should be required for the use or operation of certain other trades likely to cause fire.

These fees and the moneys accruing from fines from violations of ordinances relating to them might well go to a pension fund for the Fire Department. New York has some such system.

The entire work of revising, redrafting, codification, fees, etc., is so great as to warrant a special commission which should draft suitable laws."

Your proposed fire bureau, which would be a commission having the same powers within the city of Boston as the Massachusetts State fire marshal has without the city, could effectively concentrate responsibility and control fire danger here, but your fire department could not.

To secure satisfactory results you must separate your "fire-prevention and inspection service" from your "fire-fighting service." They should mutually check each other. Adequate inspection, backed by proper legal power, alone will control the ignorance, carelessness and selfishness of property owners and users in our cities. Boston is not alone in this difficulty about her fire danger. New York, Chicago, Philadelphia, Newark, Rochester, Seattle and Birmingham are among those progressive communities which are now struggling with the same chaos in this matter which confronts you here.

Most American cities are yet without interest in, or realization of, their danger in this respect and still gamble on "nothing very bad happening." It does not seem enough to get proper laws studied, prepared and enacted. For instance, a State Fire Marshal law was passed nearly a year ago in Pennsylvania and an appropriation of $70,000 per annum made by the legislature for this work, and yet the Governor of the State, who signed this law, has virtually nullified it to date by neglecting to appoint and organize the department under the law, and no influence has yet been able to move him to take this step.

Again, the Pennsylvania Legislature passed a Fire Marshal law for the city of Philadelphia during the past year, and the fire marshal was appointed, but the actual conduct of the office by the official in charge has so lacked in scope and efficiency as to have virtually nullified the law.

The control of American fire waste must come from competent study of existing laws in each State and city and a preparation, enactment and enforcement of proper legislation to correct present bad conditions everywhere.

It then becomes necessary to so organize public opinion with such political force behind it that our executives of the city or State will actually force these studied and enacted regulations.

If our former immense and largely needless life and property loss from fire waste all over this country will bring these truths home to the people so that all States and their cities will enforce substantially uniform minimum regulations simultaneously to control this danger in the future, then the price has not been too great to have paid for such a future.

Workmen, women particularly, and the labor unions, certainly suffer most from present fire danger and should be first to advocate this entire movement.

I trust that you as architects and engineers will spread this doctrine more actively through your clients to the public and hold it fully in mind in all your future work.

POWELL EVANS

(3) FIRE WASTE

(Reprint from *Survey* (N. Y.), July 1, 1911.)

*The contributor of the following article is president of the Merchant and Evans Company, the Schuylkill Railway Company, and the *International Sprinkler Company, and director of the Tradesmen's National Bank, Philadelphia. The conclusions presented are based on his experience as merchant, manufacturer, and engineer, and have the weight of an intimate knowledge of fire prevention and protection engineering extending over the past ten years, together with a comparative study of the subject abroad during the past five years.*

As chairman of the fire prevention and insurance committees of the National Association of Manufacturers, the National Hardware Association, the National Association of Credit Men, and the Bureau of Municipal Research, Philadelphia, he has since 1907 been in close touch with the preparation of legislation to control fire waste from the standpoint of the buyer of insurance. The fire marshal law, which has been before the current Pennsylvania Legislature, embodies many of his ideas. It is published in this issue in part.

Mr. Evans made a report on Fire Waste of Created Resources at the First Conservation Congress in Washington, in May, 1908, which was later adopted by the National Board of Fire Underwriters as its official utterance on the subject on that occasion. He was a witness before the Legislative Investigating Commission on the subject of Fire Prevention during its hearings in New York the past winter. The great factory fires in New York and Newark give marked timeliness to the facts and views he so vigorously presents.

Fire waste in the United States and Canada is about ten times that of western Europe. It averages broadly $250,000,000 yearly, with $150,000,000 added expense for protective measures imperatively demanded by this great, continuous, and increasing loss.

The 1910 fire waste would pay the total interest-bearing debt of the country in four years; or would build the Panama Canal in less than two years. In other terms, it exceeds the combined cost of the United States Army and Navy and the interest on the National debt; or nearly equals the combined annual failures and pension payments in the United States;

---

*NOTE.—Resigned January 1, 1913, and now conducting automatic sprinkler department in own business—Merchant & Evans Co.

or exceeds the combined United States gold and silver production and Post Office Department receipts—these all annual figures.

It represents about 40 per cent. of either the total unused United States Government receipts or total expenditures, or the net earnings of American railways; it represents about 80 per cent. of either the United States Internal Revenue receipts or the United States Customs or the interest paid on the railways in the country. The fire waste of the United States in the past ten years exceeds the amount of gold held in the United Kingdom, Austria, Hungary, Italy and Spain. It is equivalent to wiping out the entire corn crop once every ten years, and exceeds the annual value of wheat, hay, rye and oats. It is twice the annual value of the cotton crop. It costs about $30,000 for each hour in the year, or $500 for each minute. It costs, moreover, more than 1500 lives and 5000 serious injuries annually.

If all buildings burned last year in the United States were placed together on both sides of a street, they would make an avenue of desolation reaching from Chicago to New York, and although one seriously injured person were rescued every thousand feet, at every three-quarters of a mile a man, woman or child would nevertheless be found burned to death.

This fire loss averages three dollars per capita in America each year as against thirty cents in Europe. It is absolute loss, and never transference of value. It positively does no good to anyone. About two-thirds of this waste in life and property in this country could easily be avoided by means similar to those employed in western Europe, where the loss is about one-tenth of ours.

There are certain conditions in these foreign countries that operate to effect a lower fire loss than would reasonably be possible here, viz: the larger use of non-combustible materials, due to the higher cost of wood; better building codes, in letter and practice; the lower height and smaller areas involved in city construction; and finally, the intangible influence of older civilizations, which makes people more careful of small savings in all their affairs and generally more cautious than we have yet become.

Allowing duly for these fundamental differences between the countries compared, it is yet apparent that the difference in fire loss in the United States over that of the principal western European countries is outrageously and criminally greater than it should be; and this condition must arise largely from the ignorance, the carelessness, and the indifference of this country's inhabitants. Ignorance, carelessness, or isolated self-interest, when they result in the tremendous sacrifice of life and property now habitually occurring among us from this one cause, become nothing less than criminal.

It has been argued by some that so far in our national development the toal gain to national wealth, arising from the permissible construction of buildings below the desirable standard of fire-resistance (thus enabling men with limited capital to engage in business operations without undue expenditure on property), has been greater than if too restrictive building laws had been operative. There may have been some merit in this argument applied to times and conditions which have passed, but we should now unquestionably, on the evidence before us, begin to enforce in our cities, and enforce rigidly, a higher standard of fire-preventive building construction, protection, and occupancy. In many European cities a fire is held substantially a crime, and the owner of the property where it occurs, regardless of size, must report the facts to the authorities and may be penalized.

The world's insurance bill is the measure of its fire waste. In the United States insurance costs, on the average, about 1 per cent. of the policy value, or one dollar per one hundred, with three dollars per capita fire waste; whereas, in western Europe, insurance costs on the average one-tenth of 1 per cent. of the policy value, or ten cents per one hundred, with thirty cents per capita fire waste.

The sound rule follows that, as fire waste is reduced, the cost of insurance automatically falls in proportion, and from this cause only. Insurance is not a commodity in the usual term; it is a tax which distributes the fire waste of the country over its population. It is fundamentally a nation-wide average. About one-half of all insurance premiums collected is returned to the insured for fire losses, and the remaining one-half goes for expense and profits in the insurance business. Unduly numerous or large fires, or conflagrations, swell the total waste bill, and automatically rates rise everywhere within the national boundaries, until the half of all collections is great enough to pay these losses. Every inhabitant of the country contributes an average share of these insurance bills; higher rents, clothing, and food bills—and through them higher credit rates and interest on loans. No one can escape. In the large, it can safely be said that every workman pays this three dollars yearly for every member of his family, through either one or all of these channels.

Those not fully informed on the subject may ask whether the means are known and understood which will operate, if applied, to reduce materially this fire loss. Fire insurance ramifies throughout the life of our country in ways which can be compared to nothing so much as the telephone systems which reach every town and crossroads. The experience of this insurance organization, in the field and in the laboratory—thoroughly detailed, classified, and digested for years—provides a fund of sure knowledge which, if widely known and applied, would yield certain results (not conjectured, but proved by large practice over a long period); but this knowledge is now bottled up in a relatively small expert circle and is not widely enough diffused to enlighten, stimulate, and guide the public.

A brief description of this organization and its economic basis will be helpful to the layman:

Insurance throughout the world of commerce is essential for credit in borrowing money in any form or buying merchandise on time. Credit is a derivation from the Latin *credo,* I believe. It is the belief that any obligation will be met as agreed. It embraces the moral as well as the material obligation. Between incurring and meeting an obligation lies that gulf of the unforeseen which we bridge by hope and belief—whose values are measured by our resources, knowledge, caution, courage, energy, and good intent. Yet with all these present in quantity and quality we must still allow for the elements of the unexpected and uncontrollable. The total of these last named, as regards danger from fire, with the further cost and reward for providing surely and adequately against them, results in the cost of fire insurance, which is distributed as a tax over the country at large. It follows clearly and logically that insurance is an essential to sound credit and therefore a general necessity all over the country. Creditors should justly be relieved from the risk of accidental elemental destruction of the basic security, after taking the moral and commercial risk commensurate with the return without such destruction being considered. On such a limitation of risk only can average solvent credits be continuously extended. The borrower who neglects or declines to insure should justly pay the usual charge for credit plus the cost of insurance in each case. Hence the obligation for insurance in all mortgages and deeds of trust, and the wisdom of demanding it on all buildings and personal property and merchandise used as a basis for loans or credits from banks, or generally in commerce.

Therefore, in principle and practice, safe insurance and sound credit are inseparable in solvent commerce, and self-interest as well as this principle have worked to make the use of insurance almost universal.

Insurance abroad is practically all written by stock companies, conducting their business with their own capital, at their own risk and profit, at fixed rates. The policies there are usually for ten years, and by virtue of this long term and their incorporation in mortgages and deeds of trust, the stock companies are very strongly intrenched and no other system can get a start. In the United States, on the other hand, competitive insurance is obtainable on the best risks (mills, factories, warehouses, etc.) from the stock companies (largely owned abroad) on the one hand, and from the factory mutual fire insurance companies (centered in New England) on the other.

The latter, considered first—as the simple organization—consists of about twenty-five companies coöperating through one central inspection bureau, which confines its risks to such buildings as are properly built, protected, and occupied, so as to be only slightly inflammable. The insured pays his assessed rate into a pool and recovers annually as a dividend his *pro rata* surplus over the payment of losses, expenses, and a small investment fund; hence the term "mutual." This insurance has spread to large dimensions, and is found cheap, careful, and safe.

To meet this particular class of competition, prominent stock companies have combined into factory insurance associations which insure a large amount of like property at a comparatively low "flat" rate.

Stock insurance proper cares for *all other risks*—such as the bulk of city property; mills and factories of construction, protection and operation below the standard above mentioned; and miscellaneous country property.

On all these last mentioned risks higher tariffs are usually charged, representing the sum of hazards, measured by items, constituting the final rate. The officers, agents, and brokers of the stock companies in different centers constitute survey, inspection, and rating boards. Rates are applied to individual properties by about fifty of these boards, which parcel out the entire country.

The determination of rates is based on facts discovered by local inspections and the application thereto of rules based upon the engineering and commercial data and experience collected by the engineering and business organizations of the insurance business (aided by a technical test laboratory conducted by experts).

It may now be seen more clearly why civic and commercial committees, such as those whose agitations are most familiar, cannot well secure for themselves a reduction in insurance rates, and why the old device of hammering the rate without touching the cause has always largely failed, and always must fail.

It is not a sound effort in that, for one reason, it attacks the effect instead of the cause, and, for another, it attacks an opponent who cannot be caught. Either the committee represents a trade association, spread over the country and weak at any one point where it meets the local insurance rating power, or it represents any one community attacking one local rating board, which has the support of all the others.

The correct course is not to attack rates, but rather to attack the causes of fire loss which produce those rates. First better conditions, and then let the rate become a commercial question of barter and sale between the business interests purchasing it and the insurance companies selling it. If insurance is made to cost less it must in time inevitably be bought for less. In this field the engineering associations of the insurance organization are already operating. They have been energetic, careful and accurate in collecting data and drawing conclusions on the subjects of fire prevention, protection, and occupancy; but in practice this work is not widely enough known or heeded to make it nearly as effective in reducing fire waste as might now be the case, and as certainly should be the condition for the future.

The National Board of Fire Underwriters, the central organization of the stock insurance interests of the country, was originally the highest rate-making board in the organization; but of late years it has ceased to perform the rate-making function, and now confines its activities to publicity about fire waste and related matters; to promulgating the recommendations of the National Fire Protection Association and Underwriters' Laboratories, Inc., about all subjects relating to the construction, protection, and occupancy of buildings; and to the standardization and improvement generally of fire fighting methods and organizations all over the country.

To take up the first of these: The National Fire Protection Association, 87 Milk street, Boston, Mass., is composed of about 120 active members, comprising, approximately, fifty stock insurance, local underwriting, rating, survey, inspection, and engineering boards of the stock organizations; the engineering branch of the mutual insurance organization; and a number of non-insurance trade and engineering bodies—of such character as the American Institute of Architects; Electrical Engineers; the American Waterworks Association; the National Association of Credit Men, and the National Association of Manufacturers—in fact, all associations of national scope that may be interested in fire prevention.[1]

To go a step farther: The Underwriters' Laboratories, Inc., 207 East Ohio street, Chicago, is jointly conducted by the engineering branches of the stock and mutual insurance organizations. It has the most complete laboratories for its purposes in the world. It continuously collects and systematizes the field observations of the army of insurance inspectors traveling over the country, visiting properties and fires occurring therein, this data comprising the widest range of actual observed experience on the subject.

---

[1] All such associations can join as active members at fifteen dollars per year, whereupon the component members of such active members can become associate members of the N. F. P. A. at five dollars yearly and receive regularly their technical data on all fire prevention, protection, and occupancy matters.

It further conducts continual tests of materials, equipments, and methods of concerning the construction, protection, and occupancy of buildings—paralleling in these tests as nearly as possible actual working conditions. If a manufacturer desires to place a new device on the market he must first have it tested and approved by the Underwriters' Laboratories, and this approval must be promulgated by the National Fire Protection Association and published by the National Board of Fire Underwriters before it can be used in any building in the country without being penalized by a rise in insurance rates. For example, approved electric cut-out switches for ordinary lighting service remain in good condition after having been worked, say, 100,000 times. A new switch presented at the Chicago laboratories is coupled to a continuously operating machine and subjected to ordinary wear of this extent. If it falls short in any respect, the manufacturer is required so to perfect it as either to equal or excel existing devices, before it can be put on the market. A like course is followed with a new automatic sprinkler device, a new acetylene light generating apparatus, or a new method of storing bulk gasoline—with the result that the standard of all materials entering into the construction and protection of buildings, which are permitted to be used without penalization through a rise in the insurance rate,[1] are not only kept up to a known degree of excellence, but are constantly improving.

Reference has several times been made to the terms, construction, protection and occupancy of buildings. These constitute the alpha and omega of fire waste control.

> CONSTRUCTION covers the form and complete specifications of the building itself and embraces the height of structure, the fire-control areas, the elimination of concealed spaces and exposed vertical openings, and generally of avenues for the spread of flames within the building; the character, form, and strength of materials, the elimination of such as are inflammable, the provision of fireproof roofing and wireglass in safe metal frames; and generally determines all details of the nature, amount, and form of materials that will endure for the use intended and under possible heat and water exposure caused by conflagration.
>
> Careful investigation by the United States Government, and by the insurance organizations, of the Baltimore, the San Francisco, and the Chelsea conflagrations prove conclusively that proper buildings can now be erected at reasonable cost in any city for any purpose and yet meet all the necessary conditions above outlined. Yet owners and designers who principally control the matter, are not on the average sufficiently guided by these considerations, although perfectly constructed and protected buildings can now be erected in

---

[1] All approved appliances are included in the published lists of the National Board of Fire Underwriters, and most of them can be identified by labels attached to them, which may be secured by agreement from the Underwriters' Laboratories by manufacturers of the various appliances.

concrete for from twenty cents in the city of New York, down to six cents in country towns, per cubic foot.

PROTECTION.[3] Next in importance to the nature of the building itself, for limiting successfully comprises the risk of fire either within or without, comes the problem of equipping it properly to give the alarm and to extinguish fire if it occurs. The automatic sprinkler is the most important of these agents and an absolute essential for low rate insurance for buildings and contents. It has become a legal requirement, in many States, in theaters, and other buildings for large assemblages, and for dangerous parts of hotels; and its use should certainly become obligatory in all cellars in congested city areas, and in all buildings, including those used for offices, of height beyond successful control of fire streams from the ground. The sprinkler system includes its own water supply and covers the entire interior of the building—operating without human aid at the time and point of fire while at the same time sounding an alarm.

A special form of sprinkler is also employed for the exterior protection of dangerously exposed buildings. Next comes the thermostat (automatic alarm) system; the standpipe (water supply); and chemical (liquid) extinguisher.

OCCUPANCY. This term as understood by the layman covers two subjects—first, the nature of any business, and second, the manner in which any business is conducted. This last meaning is best expressed by the term management, or housekeeping as applied to the home or the factory. It covers the whole rationale of thoughtful, thrifty, and cleanly living in buildings so as not uselessly to cause fire. For example, rubbish-filled cellars, halls, and adjacent yards were, according to former Fire Chief Croker, responsible for 3000 out of 12,000 fires in New York city in 1909. Last year in Chicago 1000 fires were directly traceable to the use and abuse of matches. Uncovered lights near curtains are a cause of a constant series of fires, easily and cheaply removable by means of wire globes. Defective flues cause 13 per cent. of all fires throughout the country, nearly 50 per cent. of the fires in buildings in the South arising from this cause.

The term includes not only the many things one should not do, but the things that should be done, such as systematic fire drills in schools and factories, which will insure that in the outbreak of fire and the ensuing excitement a quick, orderly retreat of those in danger can be effected.

It is incumbent upon architects, engineers and building inspectors all over the country thoroughly to educate themselves in the engineering solution of these problems because of the general reliance placed on their supposed information on and attention to the matter. When planning or repairing any building, or installing heating, lighting, cooking apparatus or lightning rods, send an inquiry to the National Fire Protection Association, 87 Milk street, Boston.

---

[3] The following consideration of fire protection excludes that meaning of the term which comprises the fire-fighting department of cities; including the water supply, and the fire engine and patrol equipment with their appropriate organization.

Investors in new buildings should require of their architects and engineers, before contracts are let, submission of plans for criticism and suggestion, both as to the details of construction and protection, to the National Fire Protection Association or one of its active members.

Owners and tenants of old buildings should invite inspections and rerating by the local insurance bureau, which will disclose the various danger points in the construction and protection of their properties. It will be found, in a large proportion of existing buildings, that a reasonable expenditure to eliminate vertical openings, concealed spaces, unduly large areas, defective lighting and heating apparatus, etc., will pay for itself, in anywhere from one to five years, by reduced cost of insurance alone, not to speak of the reduced risk of interference with business and reduced danger to life. Such inquiry concerning large buildings or groups of buildings should invariably be addressed to both the mutual and stock organizations, and cover points of construction and protection, if the fullest information about the reduction of possible risk is desired.

In general, complete data on all these points are obtainable by application to the secretary of the National Fire Protection Association in Boston. It may safely be stated that these facts and observations, collected and analyzed by the above described machinery for many years, are very complete and certain, and if they were ascertained and employed by owners, engineers, architects and builders generally through the country—for the improvement of existing buildings and the construction of new ones—there would undoubtedly follow a gradual and continuous reduction in fire waste.

As this course is not voluntarily pursued by all concerned, it becomes the duty of the several States and of the municipalities within these States, through the medium of fire marshal laws and municipal ordinances and inspections, to enforce the betterment of fire waste conditions by compulsion. The several States, and further their municipalities, should adopt and firmly enforce from this time on minimum requirements covering the construction and protection of new buildings, the improvement and protection of old ones, and the occupancy of all.

Let me enlarge, therefore, upon the public's relation to fire waste and its control.

The manner of safely constructing, protecting and occupying almost every character of building everywhere is surely known, and in detail. The trouble is that this knowledge is not widely enough spread—even by those charged with such knowledge, such as architects and engineers—and that it is shamefully neglected for every sort of reason by many who possess it.

These remarks justly apply to the owners and occupants of the average building; to the architect and engineer who design buildings; to the builders who erect them; to the insurance manager, agent and broker supposed to scrutinize them; to the municipal officials supposed to inspect and safeguard them, and to the State officials over them all.

The continued ignorance and indifference, or worse, of building owners, occupants, designers, constructors and inspectors does not make for any higher standard for fire-preventive and protective methods, and there are no widespread and effective mandatory laws limiting the evil; hence the fire waste continues not only at the present rate but at a rising one.

The insurance interests considered in their entirety have limited public influence—no power other than imposing a high rate—and are in a measure, because of their own commercial interest, indifferent to present fire waste. It would appear to the layman at first glance that less fire waste would be welcome to the insurance business, yet the insurance influence, by and large, is far from making a united effort to reduce it. So long as an insurance company does not have to pay out more than 50 per cent. of its premiums for fire loss, the unit profit is good. Therefore one-half of a high rate nets a greater final profit than the same proportion of a low one. Hence the automatic yardstick rate schedule which companies apply to any property, which totals up the final rate in each case—having regard to the building, contents and location (exposure hazard). This might result in a premium as low as ten cents on new mills and stores (not contents), or as high as ten dollars per hundred dollars on Southern woodworking mills. Many insurance managers actually prefer the higher rate and risk as making higher possible earnings for the company and permitting a higher absolute payment to the broker, thus enabling the manager to produce a larger net annual profit, and to interest and hold a better line of brokers through whom to distribute his contracts of insurance.

The broker, who gets from 10 per cent. to 30 per cent. of the premium, objects even less to the higher rate—although, as we have seen, it inevitably means higher risk and more chance of fire, and in fact more fire waste; so the destruction continues.

The average municipal building code throughout the country is obsolete, and even so is unequally and imperfectly enforced. A few years ago I collected copies of the building codes of most of our cities. They constitute a mass of disordered, undigested and conflicting rules. In the matter of fire danger there is little difference, except in magnitude and congestion, among most of our cities, and for cities of a given size a uniform building law should be adopted and enforced.

Questions of altitude, latitude, longitude, local policies or conditions of any sort do not enter in, save only as to size, character and density of buildings. The United States Government could and should investigate authoritatively a proper building code for adoption by municipalities all over the country, elastic enough to be applicable to every size of city and town. There is neither present machinery, appropriation nor constitutional authority for the Federal Government to impose such a code on the country; but it could study and formulate and impose a code on the city of Washington which would be its authoritative conclusion on this subject broadly enough considered for national use. All persons and interests favoring a reduction of the fire waste in the country should exert their influence upon the National Government to this practical end. The several State governments could then be influenced to adopt this national municipal building code, and as far as possible influence its adoption in turn by the municipalities within their borders—a perfectly legal, practical and reasonable method of bringing into being a uniform municipal building code all over the country.

The enforcement of the building code in any city is usually accomplished through the medium of the permit and inspection bureaus, and in many of our cities these are under cover and not free to the observation of the average citizen. Here is where graft may enter. The law itself may be good (and an attempt is usually made to concede this to the public because he who runs may read it), but if that law is not honestly and actively applied and enforced what good result can come from it? It is necessary that the individual taxpayer shall have the right to know that these permits and inspections are honestly and efficiently handled. If any man wishes to know whether his neighbor's cellar is cluttered with refuse, the contents a fire-trap constantly menacing his life, property and business, or whether it holds stores of spirits or benzine or gunpowder in defiance of the law against such acts, let any one try to find out the truth in some particular instance—he will find that it is almost impossible to get at such facts under current laws and ordinances.

Few know the risk in our cities to-day of some Tarrant explosion, because some individual is permitted by carelessness, or worse, and in secret for his own self-interests, to follow the dangerous course of storing explosives within thickly populated areas. Such instances as the *Slocum* disaster in New York harbor; the Iroquois Theater fire in Chicago; the Boyertown, Pa., theater holocaust; the Collinwood, Ohio, school horror; the Newark factory fire of November 26, 1910, where twenty-six were killed, and the Washington Place disaster in New York, where 145 were killed; and numberless fatal fires in factories, hotels, stores, residences, and every sort of place of assemblage should make all citizens realize how constant is the life danger from present fire loss conditions to themselves and their families, apart from and above the money loss involved.

Proper regulations may not exist, may not be applied or enforced; and all three or any one of these loopholes constitute a great and ever-present danger everywhere.

The average American State has no machinery whatever at work on the subject. The situation is one of the unsolved anomalies of American life—that a nation of such keen and educated individuals should be so thriftless in so important a matter—fully known, generally burdensome and deplored, solved in principle, yet wantonly neglected in practice.

Under these actual conditions, unless and until the more intelligent and enlightened element of the public in the several States formulates, proposes and insists successfully upon the enactment of restrictive laws on this subject, the fire waste of life and property in the United States will continue.

State fire prevention laws are and have been for some years in highly beneficial operation in some States, and their scope and results are clear. Witness the effect of the law in Ohio, where in six years fire waste has dropped from approximately $11,000,000 to below $7,000,000, with like reduced life loss and arson, and with greatly reduced insurance cost—all with insured values doubled. Wisconsin has had like experience during the past three years.

Such legislation should cover the following main considerations:

1. Insurance should be stable, as the average policyholder is ignorant about the credit of the insuring company and assumes its soundness; hence the State should rigidly inspect and regulate the financial reliability of any insurance companies allowed to issue policies.
2. Insurance should be written by a simple and sound contract—uniform among the several States as far as possible—to protect the small policyholder who is not sufficiently informed to protect himself and not sufficiently protected by insurance companies, agents and brokers.
3. Insurance should only issue honestly and intelligently on any property, hence the broker and agent should be examined and licensed by the State as to responsibility and capacity.

The above three points cover the minimum requirements of a legal and financial character.

4. As property owners generally have not been sufficiently controlled by their own best interests, or the interest of the common welfare, to use known means to correct fire waste conditions, the State can no longer decline or neglect to protect its citizens against fire arising from improperly constructed, protected or occupied buildings.

This end can best be attained through the operation of a good fire marshal law whereby central authority and responsibility can firmly control the problem in each State. The substance of the State fire marshal and related acts introduced this year in the Pennsylvania legislature is given in the following pages. Laws of like tenor are now also before the New York legislature. Their provisions, reasonably modified for each State to conform with its local and constitutional conditions, would, together with a sound building code, provide effective control of this matter for any State or city, provided such regulations were diligently administered by a competent and faithful personnel. To this end the publicity provided in these acts is of the greatest importance as giving the public opportunity to watch the equal and faithful enforcement of the law.

The Pennsylvania bills, as introduced, incorporated the best provisions found in laws which have been operating in several States for some years, together with important suggestions brought out in the investigation of the subject conducted in the past year by the New York Legislative Investigating Committee, and also certain further proposals which to the writer's mind will make the measures more effective in practical operation. I am not one of those who believe in more law—less, if anything, is needed—but surely none can object to replacing obsolete and inadequate laws which have accumulated for years with simple, modern and effective statutes.

The fire marshal's act would:

Establish the office of State fire marshal, give courts the power to punish witnesses for contempt of his authority and to review his orders, and make it the duty of officers of public instruction and persons in charge of public or private schools to instruct children as to the dangers of fire and the prevention of fire waste.

The fire marshal is to be appointed by the Governor for a term of four years; he shall give his entire time to the work at a salary of $5000; shall in turn appoint a chief assistant fire marshal at $4000, and two deputies at $3000 each, which with clerical assistance would provide a central organization which in number and remuneration are reasonable when the area of the State is considered. The *Journal of Commerce and Commercial Bulletin,* New York, in an editorial on Fire Prevention in the issue of Wednesday, March 29th, comments on the Washington Place (Asch building) fire of recent date, and lays clear and pronounced emphasis on the bad feature of decentralized fire control in the existing organization of the New York city government. This mistake should not be allowed at this time in any State or city. The fire marshal should have the same concentrated control over buildings, existent and future, as regards fire danger as the health department now has as regards sanitation; and the plan is equally practicable and workable.

For quite as important as centralization of authority is the adequacy of assistance to the headquarters staff, so that the whole area can be covered promptly. Authorities all over the country agree that firemen, active and retired, should, as far as possible, inspect the properties they protect, both to know them in case of fire and to prevent in advance conditions which lead to fire. The Pennsylvania statute would make them assistants to the State fire marshal to this end, limiting their work, however, to such as may reasonably accord, in the mind of the State fire marshal, with their preëxisting public duties. As firemen cannot cover all the inspection work, the fire marshal should be empowered to charge city and State building and factory inspectors with watching the fire hazards as his assistants. These powers are set forth in the section following:

> Section 3. *All fire marshals* in any county, city, borough, township, school district or other municipality or incorporated district having such officers, or where no such officer exists, the *chief of the fire department thereof,* where such fire department is established, or where no such fire department exists the *chief executive officer* of such county, city, borough, township, school district or other municipality or incorporated district, together with all building permit and inspection officers or deputies or assistants thereof, and *all factory inspectors or deputies or assistants* appointed under any law of the Commonwealth of Pennsylvania, shall be by virtue of such office held by them assistants to the State fire marshal, and subject to the duties and obligations imposed by this act, and subject to the directions of the State fire marshal in the execution of the provisions hereof. The State fire marshal may also appoint *individual citizens as assistants,** who shall be subject to the duties and obligations aforesaid and to the directions of the State fire marshal. Immediately upon taking office the State fire marshal shall prepare instructions to the assistant fire marshals, and forms for their use in the reports required by this act, and shall cause them to be printed and sent together with a copy of this law to each such officer in the Commonwealth.

The duties of these assistants are set forth as follows, in terms substantially as adopted in the proposed New York act, and as they have tended, under the State fire marshal systems of Ohio and Wisconsin, materially to reduce arson:

> *The assistants of the State fire marshal shall investigate the cause, origin, and circumstances of every fire occurring in this State by which life or property has been destroyed, damaged, or endangered, and so far as possible shall determine whether the fire was the result of design or carelessness. Such investigation shall be begun immediately upon the occurrence of the fire by the assistant in whose territory it has occurred, and if it appears to the assistant making such investigation to be of suspicious origin, the State fire marshal shall be immediately notified of such fact. Every fire occurring in this State shall be reported in writing to the State fire marshal within ten days after its occurrence by the assistant in whose jurisdiction it occurred. Such report shall be in the form prescribed by the State fire marshal, and shall contain a statement of all facts relating to the cause and origin of such fire that can be ascertained, the extent of damage thereof, the insurance upon the property injured or destroyed, and such other information as may be required.

The crux of important powers of inspection—obtaining evidence, and ordering changes in the direction of preventing fires—is to be found in the following sections:

> Section 5. The State fire marshal, his deputies or assistants, upon the complaint of any person, or whenever he or they shall deem it necessary, shall inspect the building and premises within their jurisdiction.
>
> Whenever any of said officers shall find any building or structure which, for want of repairs or by reason of age or dilapidated condition, or for any other cause is especially liable to fire, and so situated as to endanger other property, he or they shall order the same to be removed or remedied, if the same is reasonably practicable, thereby lessening the danger from fire.
>
> Whenever such officer shall find in any building combustible or explosive matter or inflammable conditions wihch are in violation of any law or ordinance applicable thereto, or are dangerous to the safety of such buildings, thereby endangering other property, he or they shall order the same to be removed or remedied, and such order shall forthwith be complied with by the owner or occupant of such premises or building.
>
> If such order is made by a deputy or assistant of the State fire marshal, such owner or occupant may within five days appeal to the State fire marshal, who shall within ten days review such order and file his decision thereon, and, unless by his authority the order is revoked or modified, it shall remain in full force and be obeyed by such owner or occupant:
>
> Provided, however, that any such owner or occupant who feels himself aggrieved by such order may, within five days after the

---

*Fees of fifty cents for each fire reported, and three dollars for each day's service, are provided for assistants not receiving salaries for public duties.

same has been affirmed by the State fire marshal, file his petition with the Court of Common Pleas of the proper county, praying a review of such order and it shall be the duty of the court to hear the same at the first convenient day, and to make such order in the premises as right and justice may require.

Any owner or occupant failing to comply with such order within ten days after said appeal shall have been determined, or, if no appeal is taken, then within twenty days after the service of the said order, shall be liable to a penalty of twenty-five dollars for each day's neglect thereafter. The service of any such order shall be made upon the occupant of the premises to whom it is directed by either delivering a true copy of same to such occupant personally or by delivering the same to and leaving it with any person in charge of the premises, or in case no such person is found upon the premises by affixing a copy thereof in a conspicuous place on the door to the entrance of the said premises; whenever it may be necessary to serve such an order upon the owner of premises, such order may be served either by delivering to and leaving with the said person a true copy of the said order, or, if such owner is absent from the jurisdiction of the officer making the order, by mailing such copy to the owner's last known post-office address. The penalties herein provided may be recovered as debts are by law collectible in any courts having jurisdiction of the parties. Such action shall be brought in the name of the commonwealth, under the direction of the State fire marshal or any of his deputies or assistants, by the attorney general or by any district attorney or legally constituted law officer of any county, city, borough, township, or other municipality, who may be designated by the attorney general, or at the option of the attorney general he may designate any attorney to bring such action.

Section 6. The State fire marshal or his deputies, in addition to the investigation made by any of the assistants, may at any time investigate the origin or circumstances of any fire occurring in this commonwealth. The State fire marshal, his deputies and assistants, shall have the power to summon witnesses and compel them to attend before them, or either of them, and to testify in relation to any matter which is by the provisions of this act a subject of inquiry and investigation, and may require the production of any books, papers, or documents deemed pertinent or necessary to the inquiry, and shall have the power to administer oaths and affirmations to any person appearing as a witness before them; such examination may be public or private as the officers conducting the investigation may determine. (Here follow the usual powers to compel evidence and the usual powers to punish recalcitrant witnesses in accord with Pennsylvania practice.)

The State fire marshal or his deputies or his assistants may at all reasonable hours enter any building or premises within his or their jurisdiction for the purpose of making an inspection which, under the provisions of this act, he or they may deem necessary to be made.

Of even larger educational importance in the long run are three sections which would provide for a permanent system of keeping records, now practically non-existent or unobtainable; for semi-annual reports by property owners, automatically rendered in paying taxes; and for an educational scheme for the public schools, in line with the well-known Reed law of Ohio. The sections follow:

> Section 8. The State fire marshal shall keep in his office all records which may be sent him in accordance with law, relative to the physical condition of buildings, whether the laws and ordinances have been complied with so far as the same relate to fire protection, records of application for fire insurance upon any buildings or other information relating thereto, which may be sent him in compliance with law, and shall also keep a record of all fires occurring in this State and of all the facts concerning the same, including statistics as to the extent of such fires and the damage caused thereby, and whether such losses were covered by insurance, and, if so, in what amount. Such records shall be made daily from the reports made to him by his assistants under the provisions of this act. All such records shall be public except that any testimony taken in investigations under the provisions of this act may be withheld from the public in the discretion of the State fire marshal.
>
> Section 9. It shall be the duty of the State fire mashal to prepare blank forms for the furnishing of information by owners or occupants of buildings throughout the commonwealth of the condition of such buildings with regard to fire protection. The said blanks shall contain notice to such property owners or occupiers of proper rules and regulations to minimize the danger of fire and to suppress fire waste, and shall contain certain questions requesting information of a definite chraracter to show the condition of the buildings as aforesaid. These blank forms shall be furnished by the fire marshal to officers whose duty it is to receipt for taxes on real property in every part of the commonwealth, to be given by them to property owners, together with their tax bills (two forms for each property), with the requirements that one properly filled out be forwarded to the State fire marshal at once for filing among the records of his office, and that the other be so forwarded six months thereafter.
>
> Section 10. It shall be the duty of the fire marshal to prepare in consultation with the superintendent of public instruction books of instruction for use in the public and private schools of students of all grades with regard to the dangers of fire and the prevention of fire waste. It shall be the duty of the superintendent of public instruction and of the principals or other persons in charge of the various schools in this commonwealth to provide for the instruction and training of pupils of such schools by means of drills, so that they may in sudden emergencies be able to leave the school buildings in the shortest possible time without confusion or panic. Such drills shall be held at least once a month when the schools are in session. Books of instruction with regard to the dangers of fire and the prevention of fire waste as above specified shall be published at the expense of the State under the direction of the superintendent of public

instruction, and shall be distributed in sufficient quantities for the use of the schools as herein provided, and the curriculum of such schools shall include some regular and continuous study of such subjects during the entire school year.

Other sections would provide for an annual report by the fire marshal, for the preparation before the next session of the legislature of a standard fire insurance policy (most important to assure property owners a sound and simple insurance compact), and a standard building code for adoption by municipalities. The American Bar Association has through its committee on insurance law and its allied commission on uniform laws emphatically urged uniform legislation on this entire subject.

A comparison act would provide support for the fire marshal's office (estimated at $60,000 annually) by taxing the gross receipts of fire insurance companies one-fourth of one per cent. on business done within the commonwealth. This is the Nebraska rate; the Ohio rate is one-half of one per cent. As the fire marshal reduces fire waste, the fire loss will decrease, which will first produce an important saving in the insurance payments for this loss; and this saving will be so great compared with this tax, and will come so directly from the control of the fire marshal organization, that the burden of its maintenance should rest primarily on the underwriting business. A further supplementary act would require the insurance organizations to report annually to the State fire marshal the total amounts they have at risk: more important, it would require every association or rate-making bureau to supply the State on request with reasonable data in its possession as to the physical condition of properties in the State. The unincorporated insurance bureaus possess practically all the physical data about buildings in the State and the application to these of the insurance schedule ratings (25,000 properties are listed in Philadelphia alone). These data are the accumulation of years. This cost has been included in the expense of administration of the insurance business. This expense has been an item in the determination of insurance premiums which have been collected from the public. Hence these data belong to the public, and hence to the State; hence the State fire marshal should be entitled to these data to guide his office in decisions about properties in detail. The insurance companies do not appear to object to this regulation. Any movement actually to better fire waste must start at the property, which means the procural of a volume of data about property all over the State in detail.

Finally, we have offered an amendment to the present insurance law providing for the licensing of insurance brokers and agents. Students of fire loss, and of insurance as related thereto, recognize two powerful influences at work adverse to the reduction of fire waste. As already noted much insurance is written on the broad idea that property is taken as found and assessed at a rate measured by the existing hazard. This means higher insurance, but so long as half of this premium is saved the total net revenue to the underwriter is better than if the property were improved and lower priced insurance were written. The underwriter, however, is always so deeply interested in the solvency of his company as necessarily to control fire waste in as large measure as possible. The broker on the other hand, whose income is derived from the commissions from the premiums written, would naturally, in principle, prefer high rates (which means high fire hazard), with less regard to the solvency of the company than the underwriter on the one hand, or the destruction of the property by fire than the owner on the other.

It is therefore imperative that the State should carefully license the distributors of insurance policies to property owners, and should assure that only reputable and competent individuals are authorized to conduct such business. As preliminary to a license, a broker must pass an examination prepared by the State fire marshal and insurance commissioner, and give satisfactory evidence as to his moral character. Brokers shall be deemed to be agents of the insured for purposes of procuring insurance, and agents of the company for purposes of collecting premiums. Payments of premiums to brokers shall be deemed and held as payments to the company.

Outside these insurance reforms, and the provisions centralizing responsibility for knowledge of fire conditions in a State office to which would be given important powers of prevention, and which would provide for widespread educational measures, it will be noted that these Pennsylvania bills would enable volunteers to offer their services and become effective workers in the effort to reduce fire waste.

Every man and woman in the country should be an ally of this movement; should become posted about the facts in the case; should have under law authority to report any dangerous or illegal conditions noted in any building, anywhere and at any time, to the proper authorities; and should be able to require prompt, effective, and reasonable correction —just as agents and members of the Society for Prevention of Cruelty to Animals can now inquire into and resist on the spot abuses of that nature.

The final duty of the average householder throughout the land before retiring to rest is to look at the fire or furnace in his house. The fact that this danger is so ever present tends in itself to limit opposition to it, because the fear of it is a habit and in a measure subconscious; but the moral support of the country, which is the basis of every great movement, could beyond question to my mind be rapidly and effectively organized to oppose present fire waste.

The frequent, irregular, and unrelated newspaper comment on fire losses shows the disposition of the daily press in the matter and its aid could doubtless safely be counted upon to disseminate regularly more systematized information, when the need of a thorough educational cam-

---

This article was written during the session of the Pennsylvania Legislature just closed. Mr. Evans was in Europe. The fire marshal bill became a law practically as proposed and embodies in a general way all of Mr. Evans' suggestions. The companion act providing for a revenue by taxing insurance companies failed of passage and no substitute measure was adopted, so that the cost of the fire marshal's office will have to be met by the general State revenues. The amendment offered providing for the licensing of insurance brokers and agents did not pass. In the form in which they were introduced, the bills presented a rounded program of legislation.

The New York Legislature also has passed a State fire marshal bill and, as this issue goes to press, it is awaiting the Governor's signature. This bill does not apply to New York City, where the fire prevention problem will be handled, if any one of three measures passes, by a Bureau of Fire Prevention, to be established in the Fire Department.—Ed. *Survey,* New York.

paign on the subject is made clear. I trust that State fire prevention associations will spring up all over the country, formed of and supported by citizens generally to coöperate with the growing list of fire marshals in an effort to reduce American fire waste.

With the premise admitted that we as a people know how to construct, protect, and occupy buildings reasonably immune from fire waste, it follows that the great bulk of present fire waste is largely preventable. A group of city buildings reasonably correct in construction, protection, and occupancy suffers less from fire hazard than if deficient in these three respects; a block of buildings correct in these respects is more proportionately safe from the fire hazard than any one group; while an entire city properly constructed, protected, and occupied in practice cannot burn. That such conditions can gradually be brought about, the fire map of Boston proper shows even to-day, in the gradual extension of fireproof structures over crucial areas. It is the truth in this thought which was the basis for that provision of the Napoleonic Code, still the fire insurance law of France, which provides that the individual must in a measure insure his neighbor as well as himself against fire loss.

NOTE.—The above article incorporated "Credit" considerations from an address entitled, "Fire Insurance and Prevention as Related to Credit," delivered before the fortieth annual meeting of the Fire Underwriters' Association of the Northwest, at Chicago, October 7, 1909; and various general views of the problem outlined in a paper before the First Conference on the Conservation of National Resources, White House, Washington, May 13-15, 1908.—ED. RECORD.

(4) (FIRST) CONFERENCE ON THE CONSERVATION OF NATURAL RESOURCES

White House, Washington, May 13-15, 1908

By Mr. Powell Evans

(On invitation of the President, Mr. Roosevelt)

This conference, remarkable in its scope and composition, owes its birth to the economic waste in many directions characterizing the national life and activity of the people of the United States. The topics of greatest importance are those which concern the undisputed waste which has and still accompanies the use of our national natural resources. Proper consideration of these questions, however, at once leads to associated subjects which seriously affect the welfare of the country's entire population, and which by their very nature can only be indirectly controlled by the National Government, but yet demand prompt and concerted action on the part of the several States.

The U. S. Inland Waterways Commission and Forest Service Bureau have during the past year urgently called attention to the widely ramifying injury inflicted on the country at large by the rapid destruction of our forests. There are three principal causes of forest waste, viz: (1) Fire, which occasions over one-third of this destruction; (2) the size of the lumber cut (about 40,000,000,000 feet, board measure, for 1907—or

8 to 9 times that of Europe, per capita), and (3) the unnecessarily destructive methods employed in cutting our timber.

Fire loss generally in the United States is closely associated with the first two causes of forest waste above defined. The tremendous forest fire waste is paralleled by proportionate fire loss in artificial wealth, as will be shown below. Obviously the admittedly unnecessary amount of all this fire waste must arise primarily from thriftless and indifferent public opinion. Public opinion, if aroused and educated on this subject, would operate to reduce all fire waste to its reasonable proportions. Again, the undue fire waste of artificial property all over the country arises to great extent from the use (and the unnecessary use, as better substitutes can be employed) of too much timber in building construction.

Restriction on the use of timber in city building would operate to substantially reduce fire loss, and at the same time materially reduce the demand for timber—thus requiring a smaller annual cut, and this principally for use in the arts, where no satisfactory substitute is obtainable.

Hence any step leading to reduced fire waste would operate to both elevate public morals on the subject and reduce the consumption of timber—a twofold help towards forest conservation.

The annual fire loss of the United States, on a ten years' average, for the years up to the end of 1902 (prior to the great Baltimore and San Francisco fires) was $146,552,365; and up to 1908 was $198,181,188.

The tremendous size of this waste may better be realized when measured with familiar items in our national expenditure.

The annual ten-year average fire loss up to the end of 1906 compares as follows with the like averages of the items given below:

36%	U. S. Government total receipts	$554,390,238
37%	Net earnings railways in United States	542,274,762
37%	U. S. Government total ordinary expenditures	532,018,116
76%	Interest paid railways in United States	261,044,569
78%	United States Internal Revenue Receipts	253,400,164
79%	United States customs	252,359,639
122%	Dividends paid by railways in United States	162,124,558
141%	United States pensions	140,861,166
152%	United States postoffice receipts	130,201,926
156%	Commercial failure in United States (liabilities)	126,646,386
157%	United States War Department cost	126,465,728
165%	Fire insurance loss payments	120,352,198
180%	United States gold production (coining value) United States silver production	109,805,439
242%	United States Navy cost	81,871,647
648%	Interest on United States National debt	30,568,000

NOTE (1)—The National "Conservation" aspect of fire waste was outlined in the above opening portion of the address.

NOTE (2)—This address was adopted as the official report of the National Board of Fire Underwriters. See Proceedings of forty-third annual meeting, May 13, 1909.

APPENDIX 10

PRESERVATION OF LIFE IN FACTORY FIRES

A Brief Account of the Good Results Obtained by Factory Mutual Insurance in the Preservation of Human Life in Factories

READ BEFORE THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS, ATLANTIC CITY, N. J., OCTOBER 1, 1913

By L. H. KUNHARDT, Vice-President and Engineer Boston Manufacturers' Mutual Fire Insurance Co., 31 Milk Street, Boston, Mass.

> "The clothing factory fire in Binghamton, by which sixty-five persons* or more lost their lives and many others were injured, is another illustration, truly awful, of the insecurity of the lives of factory employees."

The above is a quotation from a daily paper published a short distance from Boston, and it is taken as the text of this paper because anyone reading it and unacquainted with the facts would be led to the belief that no consideration has been or is given the feature of safety in factory operation by the management of our industrial enterprises. Had the author used the illustration as showing the insecurity of *some* factory employees, the force of his statement would have been evident, and furthermore it would have placed emphasis on what is also a fact—namely, that manufacturers have been and always will be in the forefront studying means and methods for securing plants against fire and employees from injury, and that in this work they are in thousands of cases far in advance of laws or other regulations enacted to promote the end desired by these laws—namely, the safety of employees.

It would not be going too far to say that the protection of factories has to-day reached a higher standard of excellence and perfection, due to the coöperation of manufacturers, than has the protection of any other class of property in the United States. This is an absolute fact.

It is perhaps with an apology that I should present some of the facts to this Association, because they are already well known to you; but this paper, it is hoped, may merit a wider circulation among the public generally, to whom it should more properly be addressed. If it awakens public interest in the good work which has been done, and leads to the adoption of the safeguards by others not now familiar with them, it will have accomplished its purpose.

It was the cotton manufacturers of New England who first laid the foundation of fire protection engineering in 1835, nearly eighty years ago, and in order that they might share mutually all possible benefits of the plan, and because the stock insurance companies absolutely refused to make concessions in insurance cost for improved conditions of construction and protection, they formed the first of the so-called factory mutual insurance companies, or the New England Mutuals, as they are often known.

The development of slow-burning mill construction was due to these men, and its success in reducing the fire losses was first demonstrated by them. Fire doors, fire walls, segregation of processes, and isolation of the more dangerous ones from the main buildings; fire escapes; enclosure or removal of belts and the substitution of electric transmission; removal of stoves and kerosene lamps; protection of gears; installation of self-closing elevator hatches and many other devices; brick stair towers; and last, but not least, automatic sprinklers, have all been the contribution of the cotton manufacturer to the development of the science of fire protection.

It would be as idle to assume that all these things were done for the safety of employees as it would be to assume that they were all done for the benefit of the manufacturer. Safety to employees goes hand in hand with safety and success to the business, and owners years ago came to recognize the fact that one cannot get along without the other. Progressive manufacturers have long endeavored to improve the conditions under which their employees work and live. In the ordinary large manufacturing plant, the investment per operative is often as much as $2500, and for each one absent from work there is an economic loss and lessened efficiency throughout the plant, and that part of the investment itself which the employee represents has, for the time being, lost its earning power, and in addition there is a loss of wages to the employee. What is more essential, therefore, than that the safety of each employee be assured and his capacity maintained at all times? Any interference with the operation of a factory, such as may occur by fire, results in consequential loss to all connected with it, and as a matter of self-interest it behooves manufacturers to care for the safety of their employees as well as of their mill buildings; and it is evident that what has accomplished one end has accomplished the other as well.

---

*Actual number was in reality only thirty-five.

The financial consideration is, of course, prominently in the mind of a manufacturer, as he is constantly confronted with the necessity of keeping down expenses to meet keen competition. Consequently the saving of insurance premiums together with the features above mentioned, all of which have to do with the financial success of the plant, have all contributed to the results accomplished and will furnish incentives for further progress.

It is not to be assumed that all factories are safe, for there are owners not sufficiently well informed or possibly not intelligent enough to appreciate that their profit depends upon safety. For these cases, legislation to require adherence to a proper standard is necessary, and I propose further on to outline what are the essentials of such a standard; but right here care should be taken that this legislation is not unjust through ignorance of proper remedies, or does not go too far, or perhaps in the wrong direction, and thus become a burden or handicap to legitimate industry.

It is to be also noted that recent fires, resulting in serious loss of life, have occurred in small factories and usually in those near the centers of cities where surroundings are more congested, and the temptation has been to crowd too many persons into limited quarters not perhaps originally designed or intended to accommodate them. The larger factories and those more isolated from other exposures, as is usually the case in the industrial establishments of to-day, which have done so much to promote the success and reputation of this country, have given most serious consideration to the matter of self-protection with the result that they have been almost entirely free from loss of life when fires occur.

As emphasizing this, I may state that the records of the Boston Manufacturers' Mutual Fire Insurance Company show that since the beginning of the factory mutual system in 1835 there have been but 35 lives lost in our factory fires, 23 of these being in an unsprinkled mill in Fall River in 1874, before the automatic sprinkler was developed and available for protection. Of the remaining 12 deaths (all occurred since 1874), 3 were killed by going back needlessly into the burning building, evidently to save personal effects, at a cotton-mill fire in 1907, and 4 were men of public fire departments killed in the performance of their duty at different mills. This leaves only 5 employees who were not able to save themselves in a period of 39 years to date, and even including all, only a total of 35 deaths have occurred in 78 years.

In factories covered by this record, all of which have fire protection and are of good construction, there are now employed 1,500,000 people, and there are in the homes dependent upon these at least 3,000,000 more, so that it may be said that there are now in these factories, or dependent upon them, 4,500,000 persons who are assured of almost absolute security of their own lives from fire, or the lives of those upon whom they are dependent—this due to the safeguards provided by the owners.

Furthermore, our insurance, it must be recognized, does not cover all the industrial establishments equipped with adequate fire protection, as our standards have been accepted to a considerable extent elsewhere. In cotton mills, for example, covered by the policies under the mutual companies, there are about 450,000 employees, and in other cotton mills there are approximately 200,000 more. Practically all of these have the benefits of fire protection, as nearly every cotton mill in this country is to-day reasonably equipped with fire-protective apparatus, including sprinklers. This proportion may be fairly assumed to apply to other manufacturing properties, and on this basis it may be stated that there are in manufacturing plants alone which have fire protection nearly 2,225,000 employees who are practically safe as regards fire, and there are certainly about 4,500,000 more dependent upon them. Thus there is a grand total of 6,725,000 persons in the

United States and Canada who are enjoying the benefits of security of life from fires *in factories*. This is a very large proportion of the working people in this country, as farmers and others not connected with factory work should, of course, be excluded.

Surely this puts to shame the quotation at the beginning of this paper and shows the injustice of its statements.

Add to the above the fact that department stores, mercantile buildings, warehouses and similar structures in cities are improving their present construction in many cases by installing sprinklers and other fire apparatus; and that new buildings are being constantly erected in which the owners, with full appreciation of the hazard of fires, are insisting on the best construction and protection, and it will certainly be evident to the unprejudiced observer that tremendous strides are being made in preventing loss of life by fire. In these classes there is estimated to be at least an additional 250,000 persons working under sprinkler protection. This is doubtless a very low estimate.

In modern protected department stores, moreover, let me call attention to the fact that, while the employees are safeguarded by good construction and protection, there are daily many thousands of customers in these stores whose lives are made secure also. As an example of this, in a large bazaar or store in Paris, a few years ago, a fire started near a counter containing celluloid goods. Before the people could get out a large number were killed and the building greatly damaged.

Let me now enumerate the essential standards which have accomplished these results. In reality there are only two main groups:

First. Construction, which must be substantial, designed to prevent the rapid spread of fire and adapted to the occupancy intended, and must take into consideration the chances of fires in certain processes and consequent hazards, as well as the number and location of employees accommodated in a given department.

Second. Private fire protection, or what may better be called self-protection, which must include as a primary feature a properly installed sprinkler system throughout every part of a factory where there is anything combustible either in the construction of the building itself or in its occupancy.

I wish to specially emphasize here that when there is anything that will burn in a building, no matter how fire-resisting or fireproof that building may be, it must be expected that the building will be burned out internally if a fire starts. The contents will burn just as a loaf of bread will burn in an oven.

To show that there is nothing new in all this, let me again quote from the records of the Boston Manufacturers' Mutual Fire Insurance Company, which by vote of its directors in 1858, among other requirements, laid down the following for a cotton or woolen mill to be insured at the then lowest rate:

> Building to be brick or stone with solid walls.
> Roof covered with metal or slate.
> Floors, plank with boards on top (the slow-burning type).
> Stairways in one or more projections of brick or stone.
> No openings in the floors from room to room (a great hazard in any plant).
> Elevators in the porch, or if inside to be closed by self-closing hatch.
> Force pumps and pipes from reservoir hydrants.
> Fixed ladders and platforms at each story.
> Casks of water and pails each story.
> Boiler room outside of mill.
> Picker room outside of mill and connected by passageway of brick with fire doors. Room to have perforated pipe sprinklers with proper supply.
> Good watchman's clock and half hourly records by watchman.
> Waste and dirt to be all removed from mill before shutting down each day, and mill to be kept in good order at all times.
> Building not to be near enough to any other to be endangered thereby.

Add to the above the requirement for the automatic sprinkler, which was developed many years later and the value of which was immediately recognized, and we have what is to-day the foundation, as it was then, of good fire protection. Details have, of course, been perfected since, but I mention it all as showing that the manufacturers who developed and maintained the mutual system were continually building up a standard for safety and were giving these matters thought far in advance of any laws relating to the subject, and it was necessary that they do this as a matter of self-interest, even if for no other reason, for otherwise their property might itself have been destroyed by fire.

The prevention of such disasters as that at the Asch building, New York, or at Newark, N. J., or at Binghamton, N. Y., has furthermore resulted in bringing our average fire loss in well-protected property down to less than $25 for each $100,000 of insurance, and the actual cost of insurance itself down to less than 5 cents on each $100. Surely this is conservation of our national resources in a most successful way, and it is fully comparable with the later efforts to conserve our natural resources to which so much time and study are being given.

In conclusion, let me emphasize that the most vital factor in preventing loss of life and property is the automatic sprinkler, and that this alone will render the great majority of fires harmless to life and of small damage to property; but there must, however, be secondary safeguards briefly covered by the general name "slow-burning construction," which means brick (or equivalent) walls; solid floors without openings between stories; stairs in outside towers; elevator and other openings protected; and safe arrangement of processes. Then, even if very rarely sprinklers fail for any cause, the spread of fire will be so retarded that the operatives can escape without harm. New legislation designed to prevent such awful catastrophes as that at Binghamton should, therefore, be shaped broadly in line with the safeguards developed by over 75 years of practical work in the large manufacturing properties of this country.

SOME OPINIONS ABOUT THE PROGRAM, PAPERS AND RESOLUTIONS OF THE NATIONAL FIRE PREVENTION CONVENTION, PHILADELPHIA, OCTOBER 13-18, 1913

DEPARTMENT OF PUBLIC SAFETY

GEORGE D. PORTER, *Director*
ANDREW S. MURPHY, *Asst. Director*

OFFICE OF THE DIRECTOR,
CITY HALL, PHILADELPHIA

MR. POWELL EVANS,
Chairman National Fire Prevention Convention
and Editor of its Record, 517 Arch Street,
Philadelphia

October 20, 1913

DEAR MR. EVANS: I desire to express to you my sincere appreciation of the good work accomplished in the National Fire Prevention Convention held here October 13th to 18th, inclusive, last. The papers and discussions proved of immense advantage to all Bureaus of this Department, both in informing them about all phases of fire waste conditions, and in stimulating them to renewed, intelligent and coordinated effort to improve fire control in this community. The Bureau of Police, Electrical Bureau, Department of Building Inspection, Fire Bureau and the Fire Marshal's Office, through their respective Chiefs, have been enthusiastic in their expressions about both the range and the excellence of the work covered at this Convention, and many of their subordinates are already showing the benefit of this broad, new and practical light on the subject.

I understand the record of this Convention is, in the near future, to be issued in book form and this Department desires to place its order now for 100 of these books at 35 cents each, the reported price, for distribution among our force. The widest possible circulation should be given this record all over the country, in my judgment—

particularly among the administrative departments of State and Municipal Governments, especially the latter.

Wishing you every success in the continuation of this excellent public work, I beg to remain,

Very truly yours,
GEORGE D. PORTER, *Director.*

DEPARTMENT OF PUBLIC SAFETY
GEORGE D. PORTER, *Director*
EDWIN CLARK, *Chief of Bureau*
BUREAU OF BUILDING INSPECTION,
313-319 CITY HALL, PHILADELPHIA

POWELL EVANS, ESQ.,
Chairman, Fire Prevention Commission,
Philadelphia, Pa.

December 30, 1913

DEAR SIR: The Hon. William Redfield, Secretary of the Department of Commerce, well said at the Fire Prevention Convention held in Philadelphia, October 13th to 18th, 1913, that in order to correct and prevent the fire waste in this country, it must be accomplished by means of education.

As a member of the N. F. P. A., attending that convention, I know of no better means to do this than by the publication and distribution of the papers presented at the Fire Prevention Convention, held on the above dates, and I am sure that architects, engineers and business men in general would profit by securing copies of these papers and giving the matter their careful consideration.

Very truly yours,
EDWIN CLARK, *Chief.*

STATE OF NEW YORK
THOMAS J. AHEARN, *State Fire Marshal*
GEORGE F. ROESCH, *First Deputy*
EUGENE D. STOCKER, *Second Deputy*
P. J. GILLESPIE, *Chief Engineer*
DEPARTMENT OF
STATE FIRE MARSHAL, ALBANY

MR. POWELL EVANS, *Chairman, N. F. P. C.,*
Philadelphia, Pa.

December 31, 1913

DEAR MR. EVANS: I desire to express to you my sincere appreciation of the excellent work accomplished at the National Fire Prevention Convention held in Philadelphia October 13th to 18th, inclusive. It would be impossible to relate the amount of good instruction and new ideas which were received at that time by the discussion of the many able papers and arguments springing therefrom. It covered an immense amount of information relating to all phases of fire waste conditions and was conducive of stimulation to renew intelligent and coöperative effort to improve the fire control in all buildings.

I regret that the State Fire Marshal at present is confined to his home by illness. It was my understanding with him before his illness that copies of the Convention's work should be ordered for our assistant State fire marshals throughout the State of New York. This would entail a large expense, and until his return it would not exactly conform to the rules and regulations of this department that it should be given by me at this time. I shall, however, be pleased to place with you an order for 100 copies at 35 cents each, and if possible we shall increase the order at a later date.

Wishing you every success in the continuation of your excellent work, and with best wishes for a Happy New Year, I remain,

Yours truly,

EUGENE D. STOCKER,
Deputy State Fire Marshal.

COMMONWEALTH OF PENNSYLVANIA

JOSEPH L. BALDWIN,
Fire Marshal
CHARLES D. WOLFE,
Chief Ass't Fire Marshal

DEPARTMENT OF THE FIRE MARSHAL
HARRISBURG

MR. POWELL EVANS, care of Merchant & Evans Company,
Sixth and Arch Streets, Philadelphia, Pa.

December 18, 1913

DEAR SIR: I am in receipt of your communication of the 15th instant in reference to subscribing for distribution, book containing the proceedings of the Fire Prevention Congress held in Philadelphia from the thirteenth to the eighteenth of October inclusive, and in reply beg to state, it gives me great pleasure to report that this Department will subscribe for twenty-eight hundred (2800) books at thirty-five cents (35c) f. o. b. Philadelphia.

The proceedings of this Congress have been to me most interesting and instructive and has, to my mind, called to the attention of the public that Fire Prevention is as essential as fire fighting. I believe that when the proceedings of this Congress are distributed and thoroughly digested by the public it will show what legislation is needed to better conditions in the work of Fire Prevention.

I assure you the representatives from this Department, who attended this Congress, were greatly benefited from the knowledge gleaned from the different subjects brought forward for consideration and hope that a similar Congress will be held next year.

With kind regards personally, I am, respectfully yours,

J. L. BALDWIN,
State Fire Marshal.

THE COMMONWEALTH OF MASSACHUSETTS

FRANK WM. RANE, B. Agr., M. Sc.,
State Forester

OFFICE OF THE STATE FORESTER,
6 BEACON STREET, BOSTON

POWELL EVANS, ESQ., 420 City Hall,
Philadelphia, Pa.

October 21, 1913

MY DEAR MR. EVANS: I desire to thank you most heartily for not only your kind invitation but for a most profitable and enjoyable meeting which I had the pleasure of attending through your courtesies at Philadelphia. Your efforts cannot help from being productive of great good. I was particularly impressed with your earnestness in endeavoring to point out a plan whereby great good must ultimately result in fire prevention. I shall be pleased to keep in touch with you and your work in the future. Should you be in Boston any time, would be pleased to have you call upon me.

Very sincerely yours,
F. WM. RANE,
State Forester.

FIRE DEPARTMENT OF THE CITY OF NEW YORK

JOSEPH JOHNSON,
Commissioner
GEORGE W. OLVANY,
Deputy Commissioner
DANIEL E. FINN,
Secretary of Department
JOHN KENLON,
Chief

BUREAU CHIEFS
WILLIAM GUERIN,
Fire Prevention
LEONARD DAY,
Fire Alarm Telegraph
JOHN R. KEEFE,
Repairs and Supplies
157 EAST 67TH STREET, NEW YORK

HON. POWELL EVANS,
Chairman, Fire Prevention Commission,
City Hall, Philadelphia, Pa.

October 28, 1913

DEAR SIR: After returning from the Fire Prevention Convention held in your City October 13th to 18th, 1913, and reviewing the work that has been performed by that body in the passage of the various resolutions and the presentation of the several papers treating on fire prevention in all its principal phases, together with the discussions thereon, I am of the opinion that the work of fire prevention has been set forward to a far greater degree than I expected it would be in the next five years to come.

I shall await impatiently your publication of the proceedings and will endeavor to have the Merchants' Association and the Chamber of Commerce, and all other bodies having the welfare of this City at heart, to purchase as many copies of the proceedings of the convention as they will for distribution to the public for educational purposes.

Respectfully yours,
WILLIAM GUERIN, *Acting Chief,*
Bureau of Fire Prevention.

HEADQUARTERS FIRE DEPARTMENT, CITY OF BOSTON
CHAS. H. COLE, *Commissioner*
BRISTOL STREET, BOSTON

MR. POWELL EVANS,
Chairman, Fire Prevention Commission,
Philadelphia, Pa.

October 21, 1913

MY DEAR MR. EVANS: I want to take this early opportunity to express to you not only my congratulations on the success of the Fire Prevention Convention at Philadelphia, but also my appreciation of the amount of time and hard work that you put into the matter. No one realizes what a thankless job such work is, and how hard it is for the person who does this work to realize that he has accomplished any good. I know, however, that this meeting has done a great deal of good, and also that the ideas exchanged there will help us thruout the country; also that your example as a private citizen doing this public-spirited work is most encouraging to others in the same line of work.

Everything the Convention did was done unanimously, which is quite a remarkable record. I hope also that you will not let the little matters of disagreement as to minor details discourage you in the least, as these only emphasize the interest of earnest and enthusiastic men on the subject.

I want to thank you, and thru you his Honor, the Mayor of Philadelphia, and the Director of Public Safety, for the many courtesies extended to us while in Philadelphia. Should any of you ever come to Boston I will be most anxious to try and reciprocate.

Yours very sincerely,

CHAS. H. COLE,
Fire Commissioner.

NATIONAL FIRE PROTECTION ASSOCIATION
ROBERT D. KOHN, *President* 87 MILK STREET, BOSTON
FRANK M. DRAKE, *Vice-President*
FRANKLIN H. WENTWORTH, *Secy. and Treas.*

MR. POWELL EVANS, *Chairman,*
Philadelphia Fire Prevention Commission,
City Hall, Philadelphia, Pa.

October 21, 1913

MY DEAR MR. EVANS: Permit me once more to express my keen interest in the forthcoming publication of the Proceedings of the National Fire Prevention Convention held last week in Philadelphia. I do not believe any student of the fire waste and methods for its curtailment can afford to be without this publication. As soon as a circular or other literature is ready setting forth the conditions and terms under which it may be purchased we would like a sufficient number of copies to send out at our own expense to our 2500 associate members, many of whom will desire to have the book. Again assuring you of the admiration I have for the systematic and able manner in which you put through the Philadelphia Convention, I am,

Very truly yours,

FRANKLIN H. WENTWORTH,
Secretary.

CAMBRIDGE MUTUAL FIRE INSURANCE COMPANY
G. A. A. PEVEY, *Pres.* 763 MASSACHUSETTS AVENUE,
W. E. BURRAGE, *Vice Pres. and Treas.* CAMBRIDGE, MASS.

POWELL EVANS, ESQ.,
Chairman Fire Prevention Commission,
Philadelphia, Pa.

October 25, 1913

DEAR SIR: As a delegate to the recent Fire Prevention Convention at Philadelphia, I wish to say that to me every day was filled with opportunities, to receive from experts in every line the latest up-to-date information obtainable upon the topics discussed. It was a great pleasure also to feel that I was a part of such a work. I have never attended a convention which seemed to accomplish more definite results, and it must be a great satisfaction to you to feel that you landed somewhere, and that the work so well planned will be carried forward under such a management as that of the N. F. P. A.

Very sincerely yours,
Wm. E. Burrage.

CINCINNATI — CHICAGO
430-4 LINCOLN INN COURT — 1362 INSURANCE EXCHANGE
NEW YORK, 100 WILLIAM STREET
MINNEAPOLIS — KANSAS CITY
215 PLYMOUTH BUILDING — 516 RESERVE BANK BUILDING
FIRE PROTECTION
A National Monthly Devoted to Every Phase of Fire Protection
and Prevention Non-technical and Educational. $1.50 Per Year
EDITORS:
E. JAY WOHLGEMUTH
PAUL MASON

CINCINNATI, October 23, 1913

MR. POWELL EVANS,
Chairman Fire Prevention Commission,
Room 420, City Hall, Philadelphia, Pa.,

DEAR SIR: I am taking the earliest available moment since my return to Cincinnati to write you, expressing my appreciation of the splendid meeting which was the first result of your call for the convening of a National Fire Waste Congress. The importance of the fire waste problem and the necessity of effective fire control, are so great that until the meeting of this Congress it seemed to me an almost hopeless task to attempt the crystallization of public sentiment concerning them into a living force which would have—or could have—an appreciable effect in reducing fire losses. The Congress, however, has demonstrated that there is a large element of our business and professional men awake to the seriousness of the problem and working earnestly toward its solution. The results of the Congress, therefore, in my judgment, not only should mean a great increase of intelligent effort to the end sought, but also much more general coöperation and coördination of effort among various agencies which have been indifferent to the question involved, or to the work of the other agencies, if not actually hostile on account of divided or overlapping authority.

The only reason to doubt that great ultimate good will materialize from the sessions of the Congress, it seems to me, lies in the fact that the *distribution of the report of the proceedings may be too small to be effective as it should be.* Those who are awake to the seriousness of the situation and are concerned in its betterment certainly should *contribute liberally* to the *general distribution of the knowledge the report will contain.* Whether they will do so can only be demonstrated with the passage of time. I am framing my report on the Congress to the city of Covington and also, having presented the invitations of the city of Cincinnati and the Cincinnati Chamber of Commerce to the Congress to hold its next sessions in this city, I shall make reports to both the City and the Chamber setting forth the general scope of the sessions and the important information and knowledge adduced. In each case I shall recommend that as many copies of the report as can be used to advantage be subscribed for as soon as possible, and also will recommend to several other bodies with which I am in touch that similar action be taken.

Again expressing my appreciation of the meetings, and also of your courtesies to me; trusting that the ultimate results shall be all that we have reason to hope for and shall come quickly, and trusting that we shall be thrown together in this work many times in the future, I am, Very truly yours,

PAUL MASON,
Editor, Fire Protection.

ARCHITECTURE AND BUILDING
A Continuation of the Architects' and Builders' Magazine
Published by THE WILLIAM T. COMSTOCK CO.,
23 WARREN STREET, NEW YORK
EDITORIAL DEPARTMENT

MR. POWELL EVANS,
Chairman Fire Prevention Commission,
420 City Hall, Philadelphia, Pa.

October 25, 1913

DEAR MR. EVANS: I was one of those who had the pleasure of attending the recent National Fire Prevention Convention in Philadelphia from the 13th to the 18th of this month, and I was so greatly impressed with what I saw there that I feel I must compliment you upon the Convention in general and the manner in which it was conducted, and especially upon the excellent program prepared and the interest shown by the visitors, as well as the splendid papers which were read. This is the character of work that will bring about the results that all persons truly interested in fire prevention desire.

I have no doubt that it has been brought to your attention that classes have been formed in the Architectural Department of Columbia University, Chicago University, University of Pennsylvania and Cornell University, as well as some others, to study the subject of fire protection. I have no doubt that the report of the Convention which is to be published will be of much interest to these student bodies, and we will do all we can, through the columns of *Architecture and Building,* in which publication these students have become much interested since our fire proofing department has been established, to bring the report before their attention. In addition, you can rely upon *Architecture and Building* doing its utmost to aid in the general sale of the report.

Wishing you continued success in the splendid work you are doing, I am, very cordially yours,

G. H. STEWART,
Fireproofing Department.

MISSISSIPPI WIRE GLASS COMPANY
CHICAGO OFFICE, 7 WEST MADISON ST.
ST. LOUIS OFFICE, 4100 NORTH MAIN ST.
220 FIFTH AVENUE, NEW YORK

MR. POWELL EVANS, *Chairman,*
Philadelphia Fire Prevention Commission,
Room 420, City Hall, Philadelphia, Pa. October 22, 1913

DEAR MR. EVANS: Since last week I have spent many hours in thinking of the wonderful progress in fire prevention made during the week of the Convention, and, though I have always been very much interested in this work, I feel that prior to the Convention I was a schoolboy or novice so to speak.

As I should like to do all within my power to further the interests of this work, I take this opportunity to ask if you will be kind enough to mail me any good sermons you have on fire prevention.

It is needless for me to express my appreciation of the hospitality shown by Philadelphians, as I had the pleasure of doing that in person; however, I should like very much to have you put the writer down for one hundred copies of the Proceedings of the Convention.

Wishing you all success with your fire prevention work and assuring you that if I personally can in any way coöperate with you for its welfare I will be only too glad to have you call upon me, and remain,

Yours very truly,
EDWARD H. HOBBIE.

PENNSYLVANIA WIRE GLASS COMPANY
EXECUTIVE OFFICE, PENNSYLVANIA BUILDING, PHILADELPHIA
WALTER COX, *President* WORKS, DUNBAR, PA.
CABLE ADDRESS, "WIREGLASS" PHILADELPHIA
NEW YORK OFFICE, 70 FIFTH AVENUE NEW YORK
E. S. HAND, Special Representative

File 7221.

POWELL EVANS, ESQ.,
Philadelphia, Pa. November 8, 1913

MY DEAR MR. EVANS: Now that the smoke of battle has cleared away, it would seem proper to express to you my personal appreciation of the part you played in the recent fire prevention convention in your city. And this opinion is shared too, I am sure, by every unprejudiced man who attended the meetings.

The program as you wrote it was most ambitious, and the confronting obstacles were very great, but in the end the feeling must have obtained that the results justified the effort, and that a step that was worth while had been taken in the direction we are all headed.

Of course, you realized the altitude of your target, but the whole affair, both in plan and action, was so much an expression of your own thought and personality, and the height you *did* reach was so eminently satisfactory, that you are to be felicitated greatly in the outcome.

I expect to be in Philadelphia in the near future, and will give myself the pleasure of calling on you. With best wishes,

Faithfully yours,
HARRY D. PEEL.

FIRST NATIONAL FIRE WASTE CONGRESS MAKES FIRE PREVENTION A NATIONAL FORCE FOR THE FIRST TIME SINCE ITS INCEPTION

REGULATING FIRE HAZARD

Representative Body in Six-day Session Discusses Fire Waste Problems and Methods of Correction—Legal Restrictions the Probable Solution

(*From Fire Protection, Cincinnati, O., October,* 1913.)

The First National Fire Waste Congress, held the second week of October in Philadelphia, was significant—of great significance—for many reasons. In the first place, it was a purely voluntary and informal meeting; it is doubtful if half of the delegates who assembled, most of whom remained for the entire week, were present at any other than their own expense of money, time and energy. It surely is a significant fact that so many men of large affairs should leave their business for a week, at their own expense, to discuss the twin problems of fire waste and fire control.

In the second place, an enormous program was presented for their consideration. Every phase of fire as a hazard—fire prevention, fire protection, fire extinguishment and fire indemnity (which we call insurance)—was presented for discussion under an appropriate topic and with a tentative resolution which set forth in carefully considered language the crux of the problem involved. The papers thereon were of the highest possible character, presented by men of great ability; and the discussions on the floor, which were informal to a marked degree, were participated in by men of no less character and ability, and with great earnestness. This also is a fact of great import, and may fairly be taken to show that men of character, ability and large affairs are not only aroused to the importance of the problems involved, but also are giving earnest and effective study to them.

UNANIMITY OF ACTION IN ALL CASES

The fact that the action of the Congress, in every instance, was unanimous, is of tremendous importance for a variety of reasons. This unanimity, of course, will be an influential factor in securing ready adhesion on the part of the public to the conclusions thus reached, and in bringing about action in conformity therewith. It is of even greater importance in demonstrating that, no matter how great the differences of opinion on specific items among those at interest, nevertheless there is common ground on which they can get together and reach agreement that will be effective in promoting fire control. This is one of the most vital problems that confronts the fire prevention movement to-day—to find the common ground for a common work against the common enemy, fire waste. The unanimous action of the Fire Waste Congress not only demonstrates that it exists, but also that it can be found and availed of. This should simplify the greater problem of which it is a factor in the future and for all time.

This unanimity of action does not mean that there were not in the Congress vital and even irreconcilable differences of opinion on specific points, but in every instance those who were leaders in the debate in expressing diverging or antagonistic views were appointed on special committees to draft substitute resolutions to take the place of those embodied in the program, and in every case only a brief time elapsed before they were ready with unanimous report on an acceptable draft, which without exception met the unanimous approval of the delegates. It is not at all likely that in these cases each man got all he wanted in the resolution under consideration, or that there was not something in it which he would have preferred to be omitted, but it surely is a good augury for the future of fire prevention work that each committee found the common ground quickly, and having found it, as quickly availed itself of it.

PROGRAM BROADLY AND CAREFULLY DRAWN

That there were only three instances in which debates on the floor indicated the necessity of special committees to redraft resolutions indicates the exceeding thought and care given to substance and phraseology in framing the tentative declarations on the various subjects. With no less than 14 fundamental topics touching the four phases of fire as a hazard in the most intimate and analytical form, it really is a wonderful record that after scores of papers had been presented, in many cases advocating views in diametrical opposition, and the most ample time had been given for discussion, which also frequently brought opposing opinions to the fore, 11 of the 14 tentative resolutions were adopted without dissent as embodying the best consensus that could be obtained of opinion in the Congress, and that in the remaining three only a few minutes of time were required in each case for the drafting and presentation of a resolution which could be accepted as embodying this acceptable consensus.

It really constitutes a wonderful tribute to Mr. Powell Evans, who had most to do with the framing of the tentative resolutions, and who presided over the Congress which promulgated them as expressions of opinion carrying authority, and to the men associated with him in drafting them. It also is a splendid exposition of the high character and ability of the men who passed judgment on them, and having weighed them in all their aspects, pronounced them good.

REPRESENTATIVE BODY OF NATIONAL INTERESTS

The Congress was as representative a body of men as it could be possible to get together. Nearly every State in the Union and several provinces of Canada were represented; it was an everyday occurrence to have Atlantic and Pacific Coast States, Gulf and Middle States and the Canadian provinces through their delegates involved in debate which, however earnest and spirited, rarely became controversial in tone. Nearly all of the fire marshals who attended the convention of the Fire Marshals' Association of North America the week before remained for and participated in the Fire Waste Congress. With the fire marshals of South Dakota and Texas, respectively, were Insurance Commissioner Stablein, of the former State, and Secretary Haynes, of the insurance commission of the latter.

Probably the largest single interest represented was the underwriters', but it was far from dominating the convention, and some of its representation was apparent rather than real, as a number of men who are personally identified with the underwriters in private life were present in the convention as delegates from organizations in no way connected with insurance. There was a small sprinkling of fire chiefs and a goodly number of city fire marshals, besides delegate members of city fire prevention bureaus. All these made a distinct impression on the Congress. Three notable figures in this latter category were William Guerin, acting chief of the New York Fire Prevention Bureau; Capt. C. Albert Gasser, chief of the Bureau of Combustibles and Fire Risks, Newark, N. J., and Assistant Chief C. B. Whyler, head of inspection work in the Cleveland, Ohio, fire department. Their counsel often was asked, never was withheld, and when given was right to the point and out of the depths of rich and discerning experience.

BUILDING CONSTRUCTION AND OCCUPANCY PROBLEMS

Architects and engineers were a strong factor in the sessions, with papers by a number of them, and many contributing to the discussions. Lawyers also were in evidence, with the list of speakers including men who had special experience in drafting building codes, enforcing building and inspection laws and studying the legal phases of fire marshal law enforcement and the regulation of fire indemnity by statute. This group of men, although small, was in a sense the nucleus around which the Congress in a measure grouped itself, because the major proposition before the gathering was the legal imposition of legal restrictions and requirements which could be enforced by law.

There also was strong representation of building inspection departments of various cities, some former building inspectors and a number of material men, all interested in sound construction. Among these were Rudolph P. Miller, superintendent of buildings of Manhattan, N. Y.; Edwin Clark, chief of the Philadelphia Bureau of Building Inspection, and former Building Inspector Virgil M. Marani, of Cleveland.

Factory managers and superintendents of factory protection and insurance departments, railroad insurance and protection departments, mercantile and manufacturing interests of various kinds—all were present or represented in considerable number. Their presence and experience were particularly valuable in the consideration of private protection, fire drills, occupancy and management, and in some aspects of construction, legislation and education.

Nor were what might be called the minor phases of fire prevention and protection unrepresented or neglected. Forest fire protection, which is largely a problem of fire prevention, but involves also adequate provision for discovering and fighting fires; fire safety on boats, ships and railways; the development of fire marshal laws and the growth and effectiveness of the fire marshal movement; the psychology of fire waste and of the fire prevention movement and the relation of fire waste and the national carelessness, the latter largely a psychological study of the conservation movement—all had their place on the program, and were given careful consideration. In each case there was a paper or an address by an expert along the special line involved, followed by a brief discussion or the asking of questions tending to bring about a better understanding of an obscure point.

As the concluding feature of the Congress there was the question of organization. The Congress was essentially a one-man gathering, with the strong hand of Chairman Evans guiding it clear of the shoals of parliamentary technicalities, holding the delegates always to the subject in hand, and directing their deliberations with as little regard for formal organization and definite rules as was possible. In short, the entire proceedings were conducted without a formal organization, but the last day this was brought to the front. It was the consensus of opinion that the National Fire Protection Association offers every facility as an adequate vehicle for carrying on the highest type of fire prevention work, and that there is no need for another formal organization, with all the expense of headquarters and headquarters officials and employees, to undertake a work that can be so well done by the existing society. If, however, the work of the N. F. P. A. in this respect does not measure up to what ought to be expected of it, there is no doubt that a new organization will eventuate, following the calling of the next Fire Waste Congress, either next year or in 1915, by a committee consisting of Chairman Evans and Secretary Franklin H. Wentworth, of the N. F. P. A.

In the meantime, a number of chapters of the N. F. P. A. will be organized in various cities, following a plan suggested by Mr. Evans, which has been outlined heretofore in FIRE PROTECTION.

Philadelphia Fire Prevention Convention

(From *National Fire Protection Quarterly,* January, 1914)

The National Fire Prevention Convention held in Philadelphia during the week of October 13th to 18th was attended by many members of the National Fire Protection Association. The dates coinciding with the issue of the October QUARTERLY, it could not be reported in that number. This convention was initiated and conducted by Mr. Powell Evans, of Philadelphia, and the useful purpose it served in promoting the cause of fire prevention should be credited almost wholly to him. Mr. Evans has for many years been a zealous worker in this cause, and it was at his suggestion that the National Association of Credit Men and the National Association of Manufacturers first applied for active membership in the N. F. P. A.

Mr. Evans did a prodigious amount of work in planning and working out the Philadelphia convention. He personally planned the scope and title of each paper presented, that each one might fit into the scheme without duplication, and where persons who were asked to prepare papers did not respond he wrote and presented them himself. By further assuming the arduous task of acting as presiding officer of the convention at every session during the week, he was able to carry out his comprehensive plan and adjourn the convention on schedule time. It was a masterful performance and demonstrated how effectively a devoted, able and enthusiastic propagandist may work when unhampered by the advice or restraint of others.

We cannot, with our limited space, attempt more than a brief outline of the form and accomplishments of the convention. The published proceedings of the same (another Herculean task Mr. Evans is assuming) will set out the entire transactions in detail and will be available shortly. In advance of such publication Mr. Evans has kindly furnished us the main features of the activity of the convention with the resolutions as finally adopted, constituting a complete syllabus and the only correct report to date. The number of acceptances was 381 and the number actually registered 254. As there are always many at conventions who do not register, it is fair to assume that approximately 300 delegates from the national, State and municipal governments, trade, civic and underwriting organizations from all sections of the country were in attendance during the week."

LIST OF ACCEPTANCES AND CONFEREES IN ATTENDANCE (REGISTERED)

(*Shows those registered, which failed to include many in attendance.)

A

Alexander, Seaton, Wheeling Board of Trade, Wheeling, W. Va.

Atkinson, A. W., Assistant Secretary Victor Talking Machine Co., Camden, N. J.

B

*Baldwin, J. L., State Fire Marshal, Harrisburg, Pa.

Ball, W. H., Chief Bureau of City Property, Philadelphia.

*Ballard, William C., Association of Fire Underwriters, Baltimore, Md.

*Ballinger, Walter F., Architect and Engineer, and of Fire Prevention Commission, Philadelphia.

*Barrett, William T., Captain Bureau of Fire, Philadelphia.

*Barstow, Ralph, Chamber of Commerce and Credit Men's Association, Rochester, N. Y.

*Bartlett, Martin F., Special Agent, Queen Insurance Co., representing State Board of Trade, Waterville, Me.

*Barton, W. R., Fire Prevention Inspector, Missouri-Pacific Railway Co., St. Louis, Mo.

*Bateman, Frank, National Implement and Vehicle Association, Grenloch, N. J.

*Benallack, William T., Manager Michigan Inspection Bureau, and Board of Commerce, Detroit, Mich.

Berry, E. B., Chief Insurance Inspector Southern Railway Co., Washington, D. C.

*Betts, B. Franklin, National Lumber Manufacturers' Association, and North Carolina Pine Association, Philadelphia.

*Billman, George W., Reading, Pa.

Bird, J. P., General Manager-Assistant Treasurer National Association of Manufacturers, New York City.

*Blackall, C. H., Architect, President Massachusetts State Fire Prevention Association, and Boston Chamber of Commerce.

*Blake, Robert W., Editor *The Spectator* (insurance journal), New York City.

Blankenburg, Rudolph, Mayor City of Philadelphia.

*Blauvelt, Albert, Associate Manager Western Factory Insurance Association, Chicago, Ill.

*Blunt, J. W., State Insurance Commissioner, Augusta, Me.

Boardman, Thomas, Engineer Factory Insurance Association, Philadelphia.

*Bolton, Reginald Pelham, American Institute of Consulting Engineers, New York City.

*Booth, George W., Chief Engineer Committee on Fire Prevention National Board of Underwriters, New York City.

Boudinot, George S., Secretary National Association of Manufacturers, New York City.

*Boyd, D. Knickerbocker, Chairman Committee on Public Information American Institute of Architects, and Fire Prevention Commission, Philadelphia.

*Boyd, James, Philadelphia Board of Trade, and James Boyd & Bro., Inc., Philadelphia.

*Brewster, A. Irving, Editor Fire Protection Department *The Insurance Field,* New York City.

Bromley, John H., National Association of Manufacturers, Philadelphia.

Brown, D. V., President Sansom street Business Men's Association, and Merchants' and Manufacturers' Association, Philadelphia.

*Brown, P. W., Insurance Inspector New York, New Haven & Hartford Railway Co., New Haven, Conn.

*Bryant, Lewis T., State Commissioner of Labor, Trenton, N. J.

Bunting, Arthur L., Secretary and Treasurer Auxiliary Fire Alarm and Telegraph, Philadelphia.

*Bunting, F. Lincoln, Captain Bureau of Fire, Philadelphia.

Burdette, H. E., Insurance Institute of Hartford, and London & Lancashire Fire Insurance Co., Hartford, Conn.

Burgess, W. M., Secretary Manton Mutual Fire Insurance Co., Philadelphia.

*Burks, Dr. Jesse D., Director Bureau of Municipal Research, and Fire Prevention Commission, Philadelphia.

*Burrage, William E., Massachusetts Mutual Fire Insurance Union, Boston, Mass.

Burt, Edward W., National Association of Manufacturers, Philadelphia.

*Busch, Miers, Philadelphia Board of Trade, Philadelphia.

*Butler, John E., Inspector of Buildings, Richmond, Va.

*Button, Joseph, State Commissioner of Insurance, Ex-Fire Marshal, Richmond, Va.

C

*Cabot, F. E., Secretary Boston Board of Fire Underwriters, Executive Committee of Massachusetts State Fire Prevention Association, Boston, Mass.

*Caldwell, James H., Assistant Fire Marshal, Philadelphia.

*Campbell, David M., Captain Bureau of Fire, Philadelphia.

Campbell, Frank L., Traffic Manager John Lucas & Co., Philadelphia.

*Canada, W. J., Associate Physicist Bureau of Standards, Department of Commerce, Washington, D. C.

Carey, Joseph M., Governor of Wyoming, Cheyenne, Wyo.

*Carpenter, Charles T., Pyrene Extinguisher Co., Philadelphia.

*Carruthers, A. C., *Safety Engineering,* New York City.

*Castle, James M., Pyrene Extinguisher Co., Philadelphia.

*Caum, E. L., Fire Marshal Pennsylvania R. R. Co., Harrisburg, Pa.

Chambers, Gordon, Chief Clerk Philadelphia & Reading Railway Co., Philadelphia.

Chase, Walter J., Executive Committee Philadelphia Fire Underwriters' Association, Philadelphia.

*Chattin, W. J., Special Inspector Associated Factory Mutual Fire Insurance Companies, Philadelphia.

*Chaussè, Alcide, City Architect and Superintendent of Buildings, Chairman Committee on Fire Prevention American Society for Municipal Improvements, Honorary Secretary Royal Architectural Institute of Canada, Montreal, Canada.

Christine, F. K., Inspector Fire Marshal's Office, Philadelphia.

*Christopher, S. W. H., Fire Prevention Adviser to Cotton Garment Manufacturers' Association, New York City.

*Clark, Edwin, Chief Bureau of Building Inspection, Philadelphia.

*Clinton, J. S., Captain Bureau of Fire, Philadelphia.

Coates, William, Chief Bureau of Fire, Pittsburgh, Pa.

*Cocker, B. Frank, Lieutenant Bureau of Fire, Philadelphia.

*Coffin, Harry, Captain Bureau of Fire, Philadelphia.

*Cohen, A. J., Vice-President Merchant & Evans Co., Philadelphia.

Cohen, M., Editor *Insurance Journal,* Washington, D. C.

*Cole, Charles H., Fire Commissioner City of Boston, and Vice-President Massachusetts State Fire Prevention Commission, representing State of Massachusetts, Boston, Mass.

*Colgan, Hugh, Battalion Chief Bureau of Fire, Philadelphia.

Collins, Grellet, National Association of Manufacturers, Philadelphia.

*Coman, William F., Coman Standpipe Co., New York City.

Congdon, Clement H., Philadelphia News Service, Philadelphia.

Connell, William H., Chief Bureau of Highways and Street Cleaning, Philadelphia.

*Connelly, James A., Cotton Manufacturer, Philadelphia.

*Coster, William H., Superintendent Bureau of Explosives, Pittsburgh, Pa.

*Coupé, William H., Jr., Inspector Fire Marshal's Office, Philadelphia.

Cox, Walter, President Mississippi Wire Glass Co., Philadelphia.

Coyle, Robert M., Chairman Executive Committee Philadelphia Fire Underwriters' Association, Philadelphia.

*Craig, Samuel D., Delaware County Firemen's Association, Sharon Hill, Pa.

*Crane, Edward A., Board of Directors American Institute of Architects, Philadelphia.

*Crans, S. E., State Fire Marshal, Pierre, South Dakota.

*Crawford, Andrew Wright, Recording Secretary City Parks Association, Philadelphia.

*Cullem, Richard J., New York State Industrial Board, State Department of Labor, New York City.

*Cummins, Daniel J., Fire Marshal Strawbridge & Clothier, Philadelphia.

D

Dailey, John H., Director of Public Safety, Pittsburgh, Pa.

Dalrymple, Charles H., License Clerk, Mayor's Office, Philadelphia.

*Dana, Gorham, Manager Underwriters' Bureau of New England, Massachusetts State Fire Prevention Association, Boston, Mass.

*Davies, H. J., Chamber of Commerce of the United States, Washington and Chicago; Secretary and Treasurer Cleveland Railway Co.; Chairman Committee on Fire Prevention and Insurance, American Electric Railway Association, New York.

Davis, C. E., Chief Bureau of Water, Philadelphia.

*Davis, Ross B., Battalion Chief Bureau of Fire, Philadelphia.

*Davis, R. W., Jr., Manufacturer Chemical Extinguishers, Philadelphia.

*Dawson, Robert O., Superintendent National Fire Protection Association, Boston, Mass.

Defenbaugh, E. R., State Fire Marshal, Columbus, Ohio.

Devlin, Thomas, National Association of Manufacturers, Philadelphia.

Diehl, Clark E., City Electrician, Harrisburg, Pa., and International Association Municipal Electricians.

Difenderfer, R. E., Congressman 8th District of Pennsylvania, Jenkintown, Pa.

*Diggs, Albert, General Fire Extinguisher Co., Baltimore, Md.

Dilkes, Charles E., Tax Agent Philadelphia & Reading Railway Co., Philadelphia.

Downes, F. A., President and Treasurer Keystone Mutual Fire Insurance Co., Philadelphia.

*Doyle, C. J., Counsel National Board of Fire Underwriters, and Ex-Fire Marshal, Springfield, Ohio.

*Drake, Frank M., Kentucky State Fire Prevention Association; Vice-President N. F. P. A.; Louisville Commercial Club, Louisville, Ky.

*Driscoll, Clement, Bureau of Municipal Research, New York City.

*Dugdale, E. W., Peelle Door Co., Philadelphia and New York City.

Dunn, Col. B. W., Chief Inspector Bureau of Explosives, New York City.

E

*Edes, Alton D., President Plymouth Commercial Club, Plymouth, Mass.

Edmonds, G. W., House of Representatives, Washington, D. C.

Eddy, Alfred W., Secretary Textile Manufacturers' Mutual Fire Insurance Co., Providence, R. I.

Ekern, H. L., Commissioner of Insurance of Wisconsin, Madison, Wis.

*Emhardt, William H., President Mutual Fire Insurance Co. of Germantown; Chairman Committee on Fire and Police; Germantown and Chestnut Hill Improvement Association, Philadelphia.

Elfreth, Samuel S., Chief Engineer Camden Fire Department, Camden, N. Y.

Elmore, F. H., Superintendent of Insurance, Southern Railway Co., Washington, D. C.

*Eneu, Joseph A., Captain Bureau of Fire, Philadelphia.

Everett, Arthur G., Building Commissioner, Boston, Mass.

F

*Fay, Joseph B., Ex-District Engineer Bureau of Fire, Philadelphia.

*Fiske, Henry A., Vice-President Henry W. Brown & Co., New York City.

*Foote, H., Bureau of Fire, Philadelphia.

*Forster, H. W., Engineer Underwriters' Laboratories, Inc., Chicago; Independence Inspection Bureau, Philadelphia.

*Foster, H. A., Chief Fire Department, Glenside, Pa.

French, E. V., Vice-President Arkwright Mutual Fire Insurance Co., Boston, Mass.

Furber, W. Copeland, Engineers' Club, Philadelphia.

*Furman, George W., Assistant Chief Electrical Bureau, Philadelphia.

G

Galloway, Walter B., National Association of Manufacturers, Philadelphia.

*Gasser, C. Albert, Inspector Bureau of Combustibles and Fire Risks, Newark, N. J.

*Gibbs, R. W., Chief Mechanical Engineer Pennsylvania Railroad Co., Philadelphia.

*Gilmour, William B., Fire Marshal Ware Bros., Philadelphia.

*Goddard, C. M., Secretary New England Insurance Exchange; Executive Committee N. F. P. A.; Chairman Executive Committee Massachusetts State Fire Prevention Association, Boston, Mass.

Godley, Philip, Vice-President American Warehousemen's Association, Philadelphia.

*Gogel, Charles H., Jr., representing Holtzer Cabot Electric Co., Brookline, Mass.

Goldstein, Albert, President Albert Goldstein Engineering Co., New York City.

*Gould, A. B., Globe Automatic Sprinkler Co., Cincinnati, Ohio.

Griel, Edward, Secretary Society for Organizing Charity, Philadelphia.

*Griffith, W. B., Engineer Camden Heating Co., Camden, N. J.

Grinnell, Russell, Vice-President General Fire Extinguisher Co., Providence, R. I.

Grove, E. M., Treasurer McConway & Torley Co., Pittsburgh, Pa.

*Gue, Harry D., Engineer Pennsylvania Wire Glass Co., Philadelphia.

*Guerin, William, Chief Bureau of Fire Prevention, New York City.

*Guthrie, F. S., Civic Club of Allegheny County, Pittsburgh, Pa.

H

*Haddock, William C., Superintendent of Construction Wanamaker Stores, New York and Philadelphia; Fire Prevention Commission, Philadelphia.

*Hahne, Irvin A., Financial Secretary Firemen's Association of Pennsylvania.

*Halkett, William G., Philadelphia.

*Hall, Edward R., National Fire Protection Association, Boston.

*Hamburger, George J., Fire Chief Prudential Insurance Co., Newark, N. J.

*Hammond, Thomas T., Association of Fire Underwriters, Baltimore, Md.

Hand, E. S., Pennsylvania Wire Glass Co., Philadelphia.

Harbeson, John F., Vice-President T-Square Club, Philadelphia.

*Harvie, W. Gordon, Underwriters' Exchange, Richmond, Va.

*Hatch, Benjamin B., Electrical Engineer; School-house Commission, Boston, Mass.

Hatch, Edward B., Executive Committee, N. F. P. A., Chicago.

*Haynes, A. H., State Fire Insurance Commissioner, Austin, Texas.

*Heaton, E. P., Canadian Manufacturers' Association, Inc.; Ontario Fire Prevention Association, Toronto, Canada.

*Henson, Edward F., Philadelphia Board of Trade, Philadelphia.

Hesselbach, H. W., Architect Southern Railway Co., Washington, D. C.

*Hexamer, C. A., Secretary Philadelphia Fire Underwriters' Association; Franklin Institute; Fire Prevention Commission, Philadelphia.

Hill, Charles B., Executive Committee Philadelphia Fire Underwriters' Association, Philadelphia.

*Himmelwright, A. L. A., Engineer, New York City.

*Hobbie, E. H., Mississippi Wire Glass Co., New York City.

*Hoenig, Philip, J., Association of Fire Underwriters, Baltimore, Md.

Hollar, William H., Philadelphia.

*Holt, George H., Chamber of Commerce of the United States; National Wholesale Lumber Dealers; National Lumber Manufacturers' Association; Northern Hemlock and Hardwood Association; Chicago. Ill.

*Hook, R. M., Manager Consolidated Fire Alarm Co., Philadelphia.

*Host, Clem P., State Fire Marshal, Madison, Wis.

*Horter, Edward M., Storeroom Clerk, Bureau of Fire, Philadelphia.

*Horton, George W., Ex-Chief Baltimore Fire Department, Baltimore, Md.

Hoy, Peter V., Chief Fire Department, Norristown, Pa.

Huebner, Prof. S. S., Ph.D., American Academy Political and Social Science, Philadelphia.

*Humphrey, Richard L., Executive Committee N. F. P. A.; President American Concrete Institute, Philadelphia.

*Humphreys, George, President Darby Fire Patrol No. 2, Darby, Pa.

*Huntley, William L., Captain Bureau of Fire, Philadelphia.

I

*Iams, Mrs. Franklin E., First Vice-President Civic Club of Allegheny County, Pittsburgh, Pa.

Imbrie, Andrew C., Committee on Fire Waste, Chamber of Commerce of the United States.

*Inglish, S. W., State Fire Marshal, Austin, Texas.

*Irvin, J. H., National Hay Association, Winchester, Ind.

Irvine, William B., National Association of Manufacturers, Philadelphia.

J

*Jackson, John Price, Commissioner Department of Labor and Industry, Harrisburg, Pa.

Jacoby, W. L., Vice-President American District Telegraph Co., New York City.

*James, Charles E., Captain Bureau of Fire, Philadelphia.

*Jamison, Thomas J., Chamber of Commerce, Norristown, Pa.

Johnson, C. C., Engineer American District Telegraph Co., New York City.

*Johnson, William H., General Inspector National Board of Fire Underwriters, New York City.

Johnston, W. Walter, Supervising Expert Pennsylvania State Building Code Commission, Lebanon, Pa.

Jones, W. F., Inspector Factory Insurance Association, Philadelphia..

Jordon, Malcolm W., Superintendent Fire Insurance Salvage Corps, Baltimore, Md.

*Joynes, W. H., Chief Fire Department, Richmond, Va.

K

Kaufman, S. E., Chamber of Commerce, Trenton, N. J.

*Keller, C. E., State Fire Marshal, St. Paul, Minn.

Kelley, Howard G., Vice-President Grand Trunk Railway System, Montreal, Canada.

*Kelly, John W., Jr., President International Association of Municipal Electricians, Camden, N. J.

*Kelly, N. B., Secretary Philadelphia Chamber of Commerce.

*Kenerson, William H., General Fire Extinguisher Co., Providence, R. I.

*Kenney, John H., Chairman Educational Committee, Fire Insurance Society of Philadelphia; Assistant Secretary Philadelphia Fire Underwriters' Association.

*Keough, — National Association of Manufacturers, New York.

*Kerford, William, Fire Inspector Philadelphia Electric Co.

*Killam, Charles W., Boston Society of Architects, Boston, Mass.

*Kilpatrick, William H., *Insurance Field,* New York City.

*Kinney, Wm. H., Universal Portland Cement Co., Pittsburgh, Pa.

*Kinsley, C. L., National Association of Manufacturers, Philadelphia.

*Kohn, Robert D., President National Fire Protection Association, New York City.

*Krake, S. G., Advertising Manager *Fire Engineer,* New York City.

*Kramer, Warren, Engineer Bureau of Fire, Philadelphia.

L

La Barre, George B., Commissioner Department of Public Safety, Trenton, N. J.

*Lacount, H. O., Insurance Department Factory Mutual Fire Insurance Companies, Boston, Mass.

Land, William P., Special Inspector Associated Factory Mutual Fire Insurance Companies, Philadelphia.

Lantz, C. A., President Pennsylvania Association of Mutual Fire Insurance Companies, Philadelphia.

Latta, Thomas S., National Association of Manufacturers, New York City.

Law, E. A., President Fire Insurance Society of Philadelphia.

*Lawler, George S., Inspection Department Factory Mutual Fire Insurance Companies, Boston, Mass.

*Lawrence, J. A., Globe Automatic Sprinkler Co., Philadelphia.

Leeds, John B., Professor Social Economy Temple University, Philadelphia.

*Lewis, Arthur M., Pennsylvania Textile Co., Philadelphia.

Lewis, Edwin O., President Associated Automatic Sprinkler Co., Philadelphia.

*Lewis, Leroy M., Secretary and Treasurer Associated Automatic Sprinkler Co., Philadelphia.

*Lipman, Lewis H., Kilfyre Fire Extinguishers, Philadelphia.

*Lindback, A., Fire Commissioner for Manitoba, Winnipeg, Canada; Ex-President Fire Marshals' Association of North America.

Loller, William H., Ex-President International Association of Fire Engineers, Ex-Chief Fire Department, Youngstown, Ohio.

*Longley, W. E., State Fire Marshal, Indianapolis, Ind.

*Love, J. Warren E., Keystone Fireproofing Co., Philadelphia.

Lucas, William E., National Association of Manufacturers, Philadelphia.

Ludlum, C. A., Vice-President Western Union, New York City.

Lukens, John M., Chief Bureau of Boiler Inspection, Philadelphia.

M

Mace, B. S., Superintendent of Insurance Baltimore & Ohio Railroad, Baltimore, Md.

*Mallalieu, W. E., General Manager National Board of Fire Underwriters, New York City.

Manning, Sydney T., Fire Commissioner, Baltimore, Md.

*Marani, Virgil G., Consulting Engineer; Chairman Building Code Committee, Cleveland Engineering Society; Joint Committee representing Cleveland organizations on proposed Ohio State Building Code, Cleveland, Ohio.

*Mason, Paul, Editor *Fire Protection*, Cincinnati, Ohio; representing city of Covington, Ky.

*Mathews, T. W., Assistant Comptroller Seaboard Air Line, Portsmouth, Va.

*Maul, Theodore R., Philadelphia; Superintendent of Construction United States Treasury, representing Oscar O. Wenderoth, Supervising Architect United States Treasury Department.

*Maynard, Frank H., President General Fire Extinguisher Co., New York City.

Meader, John H., National Association of Manufacturers, Philadelphia.

*Medary, M. R., Jr., American Institute of Architects, Philadelphia.

*Mellor, Thomas D., Chief Engineer General Fire Extinguisher Co., Philadelphia.

*Merrill, W. H., Jr., Manager Underwriters' Laboratories, Inc., Chicago.

*Meskill, John J., Acting Chief Engineer Bureau of Fire, Philadelphia.

*Meyer, O., Jr., President Bucks County Firemen's Association, Southampton, Pa.

*Middleton, Elliott, representing N. F. P. A., Memphis, Tenn.

Miller, James R., Civic Club of Allegheny County, Pittsburgh, Pa.

Miller L. F., National Hay Association, Winchester, Ind.

*Miller, Rudolph P., Superintendent of Buildings of Manhattan, New York City.

Miller, Theodore F., National Association of Manufacturers, Philadelphia.

Mitchell, George L., Merchants' and Manufacturers' Association, Philadelphia.

Molitor, John, President T-Square Club, Philadelphia.

*Moodie, George W., Battalion Chief Bureau of Fire, Philadelphia.

Moore, F. C., Insurance Institute of Hartford; Hartford Fire Insurance Co., Hartford, Conn.

*Morgan, J. William, Deputy State Fire Marshal, Harrisburg, Pa.

*Morgaridge, F. R., Assistant State Fire Marshal, Springfield, Ill.

*Morris, Richard H., Secretary Philadelphia Manufacturers' Mutual Fire Insurance Co.; Advisory Committee Philadelphia Fire Prevention Commission.

*Mucklè, Col. John S., Manager Pennsylvania S. P. C. A. and American Humane Association, Philadelphia.

*Mulhern, James O., Acting Assistant Fire Marshal, Philadelphia.

Murphy, A. S., Assistant Director Department of Public Safety, Philadelphia.

*Murphy, William H., Battalion Chief Bureau of Fire, Philadelphia.

Myers, G. Ed., State Fire Marshal, Baltimore, Md.

Mc

*McCaffrey, Edward A., National Association of Manufacturers, Philadelphia.

*McCarthy, Stephen M., Fire Marshal, Inspector, Philadelphia.

*McConaghy, George P., Captain Bureau of Fire, Philadelphia.

*McDevitt, William, Insurance Patrol; Inspector for Fire Underwriters' Association of Philadelphia.

*McDowell, William S., Attorney and Secretary Commission for Revision of Building Laws of Pittsburgh, Pa.

*McFall, James, Chief Fire Department, Roanoke, Va.; Secretary International Fire Chiefs' Association.

*McKee, J. A., Treasurer Merchant & Evans Co., Philadelphia.

*McKenzie, John A., Canadian Ticket Agents' Association, Woodstock, Ontario, Canada.

*McNamee, Timothy, Fire Marshal Wanamaker Store, Philadelphia.

N

*Nallinger, George, Battalion Chief Bureau of Fire, Philadelphia.

*Neale, Lawrence I., J. B. King & Co.; Gypsum Industry Association, New York City.

Neill, J. F., Secretary Sansom Street Business Men's Association, Philadelphia.

Nevins, Thomas F., I. A. F. Engineer; Ex-chief Fire Department, Brooklyn, N. Y.

*Newbern, R. H., Superintendent of Insurance Pennsylvania Railroad Co.; Philadelphia Fire Prevention Commission.

Newton, A. Edward, National Association of Manufacturers, Philadelphia.

*Nole, Charles B., Assistant State Fire Marshal, Harrisburg, Pa.

*Northey, Edward A., Manager New England Bureau United Inspection, Boston, Mass.

*Nute, Joseph E., Executive Committee, Chamber of Commerce, Fall River, Mass.

O

Onyx, H. P., Engineer Keystone Mutual Fire Insurance Co., Philadelphia.

O'Reilly, Joseph J., Editor *Fire Chief*, New York City.

O'Rourke, Frank X., Fire Marshal Inspector, Philadelphia.

*Osgood, Farley, Chairman Code Commission American Institute of Electrical Engineers, New York City.

*Osgood, I., Engineer Board of Fire Underwriters, Boston, Mass.

P

Paiste, H. T., National Association of Manufacturers, Philadelphia.

*Pancoast, Albert A., United Firemen Insurance Co., Philadelphia.

*Parkman, Harrison, State Fire Marshal, Topeka, Kansas.

*Patton, C. H., Chamber of Commerce; Manager Cleveland Inspection Bureau, Cleveland, Ohio.

Pearson, Joseph T., National Association of Manufacturers, Philadelphia.

Peck, Charles R., Vice-Chairman Executive Committee Philadelphia Fire Underwriters' Association.

Perry, R. S., Fire Prevention Commission; Franklin Institute; President of Harrison Bros. & Co., Inc., Philadelphia.

Phillips, H. L., Insurance Institute of Hartford; Factory Insurance Association, Hartford, Conn.

Phinney, C. H., Secretary Inspection Department Associated Factory Mutual Fire Insurance Companies, Boston, Mass.

*Pierce, George E., Fire Marshal Inspector, Philadelphia.

*Pike, Clayton W., Chief Electrical Bureau, Philadelphia.

Pingree, Edwin B., Manufacturers' Mutual Fire Insurance Co., Providence, R. I.

*Pitman, S. M., Secretary Narragansett Mutual Fire Insurance Co., Providence, R. I.

*Pitts, T. D., Automatic Sprinkler Company of America, Philadelphia.

*Plack, W. L., Engineers' Club of Philadelphia.

Platt, Charles, Jr., Executive Committee Philadelphia Fire Underwriters' Association.

Pope, George, President National Association of Manufacturers, Hartford, Conn.

*Porter, Francis H., Fire Underwriters' Inspection Bureau, San Francisco, Cal.

*Porter, George D., Director Department of Public Safety, Philadelphia.

*Porter, H. F. J., Engineer; Secretary Efficiency Society, New York City.

Potter, A. F., Acting Forester, Forest Service, Department of Agriculture, Washington.

*Prescott, James A., Boyd's Fire Apparatus, Philadelphia.

*Price, G. F. W., Acting City Architect and Superintendent of Buildings, Toronto, Canada.

*Pryor, J. Donald, General Fire Extinguisher Co., Providence, R. I.

Purtell, J. E., *Fire and Water Engineering.*

R

*Rane, F. W., State Forester, representing Massachusetts, Boston.

*Rawle, Francis, Ex-President American Bar Association, Philadelphia.

*Raymond, F. A., Engineer; Committee on Fire Prevention; National Board of Fire Underwriters, New York City.

*Redfield, Hon. William C., Secretary Department of Commerce, Washington, D. C.

*Reed, James, Assistant Director Department of Public Works, Philadelphia.

*Regar, C. Bertram, Assistant State Fire Marshal, Milbourne, Pa.

*Rhoads, John A., Fire Inspector Chicago & Northwestern Railway Co., Chicago.

Richards, E. O., President Automatic Fire Alarm Co., New York City.

*Richardson, Clinton O., Association of Fire Underwriters, Baltimore Md.

*Rieser, Robert, Secretary Hoboken Board of Trade, Hoboken, N. J.

*Riley, E. J., Inspector Erie Railroad Co., New York City.

Risteen, A. D., Insurance Institute of Hartford; Travelers' Insurance Co., Hartford, Conn.

*Robertson, George M., Engineer Board of Fire Underwriters of the Pacific, San Francisco, Cal.

*Roe, Ole O., State Fire Marshal, Des Moines, Iowa.

*Rolker, John G., Association of Fire Underwriters, Baltimore, Md.

*Rosà, E. B., Chief Physicist Bureau of Standards, Department of Commerce, Washington.

Rosengarten, H. B., National Association of Manufacturers, Philadelphia.

*Rutherford, Frank B., Secretary Pennsylvania S. P. C. A., Philadelphia.

*Ryon, Oscar B., Counsel National Board of Fire Underwriters, New York and Chicago.

S

*Sanin, G. A., Public Service Electric Co., Newark, N. J.

Sharp, D. B., Attorney of State Fire Marshal, Columbus, Ohio.

Sherley, Edward H., Home Insurance Co., Nashville, Tenn.

*Sigison, E. H., Manager Buffalo Association of Fire Underwriters, Buffalo, N. Y.

*Simmington, James, Philadelphia.

Simpson, Charles C., Executive Committee Philadelphia Fire Underwriters' Association.

*Small, A. R., Underwriters' Laboratories, Inc., Chicago.

Smith, Charles R., Secretary Smith Metal Window Hardware Co., Newark, N. J.

*Smith, George J., Chief Burgess City of Pottsville, Pa.

Smith, Walter F., Chamber of Commerce, Trenton, N. J.

Smyth, Calvin M., President Young, Smyth, Field Co., Philadelphia.

*Snellenburg, N. H., Snellenburg Clothing Co., Philadelphia.

*Souder, S. Ashton, Lumbermen's Exchange, Philadelphia.

*Soule, F. E., Foreman Fire Department, Coatesville, Pa.

*Staats, Henry N., Insurance Expert American Electric Railway Association, Bureau of Insurance, Cleveland,

*Stablein, O. K., State Insurance Commissioner, Pierre, S. Dakota.

*Steffens, W. F., Chesapeake & Ohio Railway Co., Richmond, Va.

Stern, Eugene W., American Institute Consulting Engineers, New York City.

Sternberg, Samuel W., *Insurance Field*, Philadelphia.

Steward, P. D. C., Chief Sprinklered Risk Department; Fire Underwriters' Association, Philadelphia.

*Stewart, F. J. T., Superintendent Bureau of Surveys, New York Board of Fire Underwriters, New York City.

*Stewart, G. H., Architect and Builder, New York City.

*Stocker, Eugene D., Deputy State Fire Marshal, Albany, N. Y.

*Stoney, William A., Manager Underwriters' Bureau of Middle and Southern States; Fire Underwriters' Electrical Bureau, New York City.

*Stover, Egbert P., representing State of Connecticut; Security Insurance Co., New Haven, Conn.

*Straus, M. J., Underwriters' Exchange, Richmond, Va.

*Strong, Mason R., American Institute of Consulting Engineers, New York City.

*Summerfield, C. W., Secretary Merchants' and Manufacturers' Association, Philadelphia.

Sutton, William, Secretary Market Street Merchants' Association, Philadelphia.

T

*Tate, William F., Fire Marshal Inspector, Philadelphia.

Taylor, Edward R., American Electrochemical Society, Penn Yan, N. Y.

*Taylor, James L., National Fire Prevention Association, New York City.

*Tilden, P. S., representing Harrison Berger & Co., Philadelphia.

*Tomes, Benjamin L., Editor ***American** Exchange and Review,* Philadelphia.

*Troth, H. W., Fire Chief Victor Talking Machine Co., Camden, N. J.

Trousdale, C. H., State Fire Marshal, New Orleans, La.

*Truscott, J. Lynn, Camden Board of Trade; Vice-President Camden Fire Insurance Co., Camden, N. J.

*Tucker, William R., Philadelphia Board of Trade, Philadelphia.

Turner, Warren, Hires Turner Glass Co., Philadelphia.

*Tyrell, H. S., Assistant Secretary Victor Talking Machine Co., Camden, N. J.

U

*Underhill, Frederick S., Lumbermen's Exchange, Philadelphia.

V

*VanSchaack, David, Insurance Institute of Hartford; Ætna Life Insurance Co., represented by J. C. Barton, Hartford, Conn.

W

*Waidner, C. W., Bureau of Standards, Washington, D. C.

*Walbert, Jacob, Captain Bureau of Fire, Philadelphia.

*Walker, George S., Chief Mechanician, Philadelphia.

*Walker, Sidney G., Manufacturers' Mutual Fire Insurance Co., Providence, R. I.

*Wallace, R. B., Office Recorder of Deeds, Philadelphia.

*Walsh, Michael, Battalion Chief Bureau of Fire, Philadelphia.

Warfield, Henry M., President Association of Fire Underwriters, Baltimore, Md.

Weaver, John L., Board of Trade, Washington, D. C.

*Webb, S. G., Keystone Fireproofing Co.; Gypsum Industries' Association, New York City.

Webster, George S., Chief Engineer Bureau of Surveys, Philadelphia.

*Weimer, Edgar A., President State Building Code Commission, Lebanon, Pa.

*Weiser, Eugene F., Secretary Chamber of Commerce, York, Pa.

Wells, Samuel, Engineer, New York City.

*Wentworth, Franklin H., Secretary National Fire Protection Association, Boston.

*Wernle, Joseph J., General Fire Extinguisher Co., Philadelphia.

*Weston, S. F., Globe Automatic Sprinkler Co., New York City.

*Whitney, Albert W., New York Insurance Department, Albany.

*Whyler, Charles B., Chief Cleveland Fire Department, and Chamber of Commerce, Cleveland, Ohio.

*Wiederhold, Louis, Jr., Secretary Underwriters' Association of the Middle Department, Philadelphia.

*Wilkins, W. F., Assistant State Fire Marshal, Harrisburg, Pa.

Willet, Charles E., Secretary Association of Underwriters, Baltimore, Md.

Williams, Howard T., Association of Fire Underwriters, Baltimore, Md.

*Willits, T. Abbott, Chairman National Hay Association, Winchester, Ind.

*Wilson, H. M., Engineer-in-charge Experiment Station, Bureau of Mines, Department of the Interior, Pittsburgh, Pa.

*Wilson, Louis W., Chamber of Commerce; Credit Men's Association, Rochester, N. Y.

*Wipf, Edward H., Deputy State Fire Marshal, Narberth, Pa.

*Wister, A. W., Jr., Executive Committee, Philadelphia Fire Underwriters' Association.

*Wolf, Charles D., Assistant State Fire Marshal, Philadelphia.

*Wolff, Dr. Frank A., Bureau of Standards, Washington, D. C.

Wood, Edw. R., Bureau of Municipal Research, Philadelphia.

*Woolson, Prof. Ira H., National Board of Fire Underwriters, New York City.

*Wortham, Coleman, Underwriters' Exchange, Richmond, Va.

Worthington, H. E., National Association of Manufacturers, Philadelphia.

Y

*Yeakle, J. B., Superintendent of Fire Alarm Telegraph; Fire Commissioner, Baltimore Md.

*Yost, Charles E., Deputy State Fire Marshal, Narberth, Pa.

*Young, Jacob, Captain Bureau of Fire, Philadelphia.

INDEX

PAGE

Addresses and Papers:

Baldwin, Joseph, Fire Marshal, State of Pennsylvania, Harrisburg 318-323

Ballinger, Walter F., Architect and Engineer, and Fire Prevention Commission, Philadelphia 34- 39

Bangs, Francis R., of Boston Metropolitan Fire Hazard Commission, Boston. (See Cole, C. H.)

Blankenburg, Hon. Rudolph, Mayor of Philadelphia...... 12

Benson, Capt. W. S., U.S.N., Commandant, Navy Yard, League Island, Philadelphia. 254-255

Boyd, D. Knickerbacker, Chairman Publicity Committee, American Institute of Architects 96-100

Bryant, Col. Lewis T., Commissioner, Department of Labor of New Jersey, Trenton, N. J. 275-278

Clark, Edwin, Chief of Bureau of Building Inspection, Philadelphia 45-48, 202-203

Cole, Charles H., Fire Commissioner of Boston............ 49- 53

Drake, Frank M., Lawyer and Vice-President National Fire Protection Association, Louisville, Ky. 107-110

Dunn, Col. B. W., Chief Inspector, Bureau for Safe Transportation of Explosives, New York 237-242

Ekern, Hon. H. L., Commissioner of Insurance of Wisconsin, Madison, "Fire Prevention" 270-275

Ekern, Hon. H. L., "Legislation" 286-290

Evans, Powell, Chairman, "Reasons for Calling Convention" 15- 23

Evans, Powell, Chairman Fire Prevention Commission of Philadelphia, "Public Protection" 150-154

Evans, Powell, Chairman, "Compulsory Physical Standards". 168-180

Evans, Powell, Chairman, "Legislation" 290-295

PAGE

Addresses and Papers—Continued

Evans, Powell, Chairman, Before Board of Trade, Camden, N. J., "Necessity of Organization to Fight Fire Waste". 465-481

Evans, Powell, Chairman, Before Boston Society of Architects, "Fire Waste"......... 482-491

Evans, Powell, Chairman, from "Survey" 491-508

Evans, Powell, Chairman, Before First Conference on Conservation of Natural Resources 508-509

Gasser, C. Albert, Inspector Bureau of Combustibles and Fire Risks, Newark, N. J.... 200-202

Gibbs, R. W., Chief Mechanical Engineer, Pennsylvania Railroad Co., Philadelphia...... 234-237

Guerin, William, Acting Chief, Fire Prevention Bureau, New York City 314-318

Hand, H. W., General Manager Wm. Cramp & Sons Ship and Engine Bldg. Co., Philadelphia 255

Hexamer, C. A., Secretary Philadelphia Fire Underwriters' Association, Phila.... 203-207, 455-464

Himmelwright, A. L. A., Engineer (see Porter, H. F. J.)

Jackson, John Price, Commissioner of Labor and Industry of Pennsylvania, Harrisburg, Pa. 71- 76

Kelly, J. W., Jr., "Fire Alarms" Chief of Electric Bureau, Camden, N. J.............. 147-148

Kohn, Robert D., Architect and President National Fire Protection Association, New York City 101-104

Kunhardt, L. H., V.-P. and Eng. Boston Mfrs'. Mut. F. Ins. Co., Boston, "Safety of Human Life" 510-513

Lacount, H. O., Engineer Inspection Department and Assistant Secretary Associated Factory Mutual Fire Insurance Companies, Boston.... 122-124

Lawler, G. S., Elect. Eng. Inspection Dept. Associated Mutual Fire Ins. Cos., Boston 161-165

PAGE

Addresses and Papers—Continued

Lindback, A., Fire Commissioner for Manitoba, Winnipeg, Manitoba, Can..........243-245

Loller, Wm. H., ex-President International Association of Fire Engineers and ex-Chief Fire Department, Youngstown, Ohio 268-

McDowell, Wm. S., Attorney and Secretary Commission for Revision of Building Laws of Pittsburgh, Pittsburgh, Pa. 25- 31

Mallory, J. S., City Fire Marshal, Philadelphia (see Evans, Powell, pp. 150-154).

Marani, Virgil G., Chairman Building Code Committee, Cleveland Engineering Society, and of Joint Committee Representing Cleveland Organization on the Ohio State Building Code 104

Miller, Rudolph P., Superintendent of Buildings of Manhattan, New York.......... 77- 79

Newbern, R. H., Superintendent of Insurance, Pennsylvania Railroad Co., Philadelphia 125-129

Pike, Clayton W., Chief of Electrical Bureau, Department of Public Safety, Philadelphia 144-147

Plack, W. L., Architect, Philadelphia (see Boyd, D. K.).

Potter, A. F., Acting Forester, Forest Service, Department of Agriculture, Washington, D. C. 228-230

Porter, George D., Director of Public Safety, Philadelphia.. 10

Porter, H. F. J., Engineer and Secretary Efficiency Society, New York 63- 69

Rane, F. W., Massachusetts State Forester, Boston......230-232

Rawle, Francis, ex-President American Bar Association, Philadelphia 311-314

Raymond, F. A., Engineer, National Board of Fire Underwriters, New York City.....136-140

Rosà, Dr. E. B., Acting Director, Bureau of Standards, Department of Commerce, Washington, D. C. 182-184

PAGE

Addresses and Papers—Continued

Redfield, Hon. Wm. C., Secretary Department of the Commerce of the United States, Washington, D. C. 245-251

Reed, James, Jr., Assistant Director Public Works, Philadelphia 140-144

Stewart, F. J. T., Superintendent of Surveys, New York Board of Fire Underwriters, New York City 118-122

Walker, S. G., Engineer, Manufacturers' Mutual Fire Insurance Co., Providence, R. I...264-268

Wentworth, Franklin, H., Secretary National Fire Protection Association, Boston..302-305, 336-337

Wilson, H. M., Engineer-in-Charge, Experiment Station, Bureau of Mines, Department of Interior, Pittsburgh, Pa. 181-182, 256-261

Appliances:

Lists of (including electrical fittings) 169-172

Arson:

Insurance regulations needed.... 319
Convictions for, in Philadelphia.. 384
Danger of paying losses quickly.. 220
Danger of over-insurance and remedy 326

Automatic Fire Alarms.....119, 120

Automatic Sprinklers:

Power of a City to Require...... 29
New York Law Requiring Same. 34
As a Life-Saver..............70-74-513
Efficiency of 37, 120, 123, 157, 176
Need of Ample Water Supply for 123
Water supply, charges for......155, 156
High-pressure Systems as a supply for 157, 158, 176
Average Number Required to Extinguish Fires 176
Philadelphia order for connection of Fire Engines to........... 395
Typical System 396
Photographs showing distribution of 398, 399, 400

Building Codes:

Paper on, by D. K. Boyd....... 96
Paper on, by R. D. Kohn....... 101
Paper on, by F. M. Drake....... 108
Proposed Pennsylvania Code...97, 98, 99
Proposed Ohio Code........... 105
Proposed General State Code...102, 108

PAGE

Building Codes—Continued
For Small Communities......... 108
Minimum Requirements for. 111, 112, 113
In Congested Areas............. 51, 52
Massachusetts Decision, Height of Buildings 55
Laws Needed for.............. 292
In Berlin, Germany............. 453
Discussion of 57-59, 111-116
Resolution on 117

Building Construction:
Paper on, by H. F. J. Porter.... 63
Paper on, by J. P. Jackson...... 71
Paper on, by R. P. Miller....... 77
Paper on, by G. S. Lawler...... 161
Location Features of........... 35
Safe Features of...............35-36-37
Defective Features of.......... 35
Height of 31, 32, 55, 77
Area between Fire Walls........ 37
Window Openings............. 37
Cement Blocks for............. 42
Walls for...................... 58, 78
Heating of..................... 161
Lighting of.................... 162
Plumbing of.................... 162
Ventilation of.................. 163
Roof Construction for........... 38
Fire-Resistant Essentials......... 78
New Jersey Requirements for. 80
Power of States and Cities to Enforce Building Laws....... 29
Resolutions on................. 95, 167

Bureau of Standards (United States Government):

Description of.................. 183
Should formulate all Standards 179-182, 185-187, 191-195
Resolution referring to.......... 199

Chemicals:
Dangers of 455
Safeguards for 456

"Clean-up Week" (see "Fire-Prevention Day") 438-439

Concrete (see "Building Construction")

Conflagration Zones (see "Exposure Hazards")

Department Stores:
Fire Brigade in................ 131

Decorations:
Dangers of 163

Education:
Paper on Necessity for, by F. H. Wentworth 302

PAGE

Education—Continued
Work of N. F. P. A. for........ 303
Should be carried on by Fire Marshals 306
Resolution on 310

Electricity:
Lighting by, dangers of.......... 162

Electric Signs:
Dangers of 165, 166

Electrolysis:
Dangers of 131, 148, 149

Equipment (of Buildings):
Paper on, by G. S. Lawler....... 161
Resolution on 167

Explosives:
Dangers of 462
Transportation of 237

Exposure Hazards:
Paper on, by W. F. Ballinger... 34
Paper on, by Edwin Clark 45
Paper on, by C. H. Cole and F. R. Bangs 49
Paper on, "Legal Basis for Regulation of," by W. S. McDowell 26
Some to be avoided............ 35
Conditions Forming Conflagration Zones 45, 49, 50
Philadelphia Danger Zones 46, 47
Building Requirements in Congested Districts 51, 52
Segregation of Hazards....... 59, 60
German Zone System............ 60
Wide Streets as Barriers........ 60

Factory Mutual Laboratories:
Method of Approving Devices... 174

Fires (Lessons of):
San Francisco 40
Binghamton, N. Y..........70, 133, 295
New York City (Triangle Building) 125, 295
Newark, N. J. 134, 294
Philadelphia, Pa. 206
Steamship "Imperator" 256
In Mines, causes of 258
Danger of paying losses too quickly 220

Fire:
Paper on "Chemistry of Fire" by C. A. Hexamer 455

Fire Alarms:
Paper on, by Clayton Pike........ 144
Address on, by J. W. Kelly....... 147
Discussion of 147
Automatic 119, 120

PAGE

Fire Drills:
Paper on, by R. H. Newburn.. 125
Need of 63, 87, 89, 125, 126
In Theaters 127
New Jersey, practice in.......... 276
Pennsylvania Laws regarding.. 422
Philadelphia Regulations for .. 423
Resolution on 135

Fire Departments (Public)
Suggestions for 137
State Control for 75
In Congested Areas.............. 52
Resolution on 160

Fire Doors 84

Fire Escapes:
Types of 63-66, 79
Philadelphia Stair-tower........65, 66, 73
Outside type (weakness of)
65, 70, 74, 79, 88 90-95
New Jersey Requirements for.... 80
Fire Walls used as..65-68, 82, 83, 85-87
Plans of 80, 81
Width of Stairways.............. 127
Resolution on 95

Fire Extinguishers:
Value of 121
Use of Sawdust as.............. 124

Fire Marshal:
Address on, by A. Lindback...... 243
Power of 54, 244, 404
Inspections by 211, 217, 219, 273, 290
As an educator..................304-306
Should have insurance rates data 361
Should control occupancy of buildings 56
Pennsylvania Law creating for city and legal opinion thereon......401-405
Pennsylvania Law creating for State 440
Proposed General Law creating.. 501
Number of States having......... 16
Philadelphia Fire Marshal's report (1913) 381
Fire Pails 120

Fire Prevention:
Address on, by Hon. H. L. Ekern before City Club, Chicago...... 270
Need of Public Education for.... 286
In Germany 449

Fire Prevention Association (State) 446

Fire Prevention Commissions:
Phila. Organization and work of 20, 299
Phila. reports of................406-415
Ohio Report of................. 446

"Fire Prevention Day" (see "Clean-up Week") 438-439

PAGE

Fire Protection (Public):
Paper on, by F. A. Raymond...... 136
Paper on, by Powell Evans and J. S. Mallory 150
Resolution on 159

Fire Protection (Private):
Paper on, by F. J. T. Stewart..... 118
Paper on, by H. O. Lacount.. 123
Fire Brigades needed...........128-131
Resolution on 135

Fire Shutters:
Shutters vs. Wired Glass.......40, 41, 42
Types of 79

Fire Walls:
As a Means of Escape....65, 67, 68, 82-87

Fire Waste:
Amount of 1, 491, 509
Cost of 16, 21, 352, 465
Causes of 21
In Cities of U. S................270, 407
Reports on 491, 508
Investigation by States........... 16

Flues:
Dangers of 110, 427
In Hotels 167

Forest Fire Prevention:
Paper by A. F. Potter (U. S. Government) 228
In Massachusetts 230

Fuel Oil (see "Gasoline")

Gas:
Use for Water Heaters, dangers of 165

Gasoline and Fuel Oil:
Dangers of and Regulations for.. 164

Heating Systems (see "Building Construction")

High-pressure Fire Systems (See also "Water"):
Paper on, by James Reed, Jr...... 140
As a supply to Sprinklers....157, 158, 176

Hose (see also "Standpipes"):
For Steamboats 262

Hose Couplings:
Need for Uniform Standard of,
154, 155, 188

Housekeeping (see "Management"):

Hydrant Systems:
Private 122
High-Pressure 142

PAGE

Inspection (by Fire Departments):
In Philadelphia, 151-155, 208, 209, 299, 353, 356, 388, 412
In Cincinnati 212
In Cleveland 213
In New York 213, 214, 356
In St. Louis 215
In Boston 297
In Newark, N. J. 211
In York, Pa. 214
In Various Cities 150, 155
Right to inspect 210
Need of Municipal Inspections 208, 296
Used also to Improve Sanitary Conditions, etc. 435
Inspection Report Blank for 417
Philadelphia Report Blank 431
Philadelphia Instructions to Inspectors 386, 420
Philadelphia Improvements Secured (1913) 388

Inspections (by Fire Marshal):
In Illinois 217
In New York 219
In Maine 211
In Wisconsin 273

Inspections (Insurance):
Methods of Factory Mutual Companies 265, 480
Report Blanks of Factory Mutual Companies 362, 363
Report Blanks of Stock Companies 364-370
By State Fire Prevention Associations 446-448

Insurance and Insurance Companies:
Paper on, by Francis Rawle 311
Paper on, by William Guerin 314
Paper on, by J. S. Baldwin 318
Standard Policy, need of 312
Uniform National Policy Form, need of 313, 323
Uniform Survey and Rating Schedule, need of 350
Decree of Penna. Courts as to publicity of rates 359
Methods of Fixing Rates 358
Rates in New Jersey 211
Rate Schedules 372-380
Proposed Application Blank for 321
Associations of Insurance Companies 17
Boards of Underwriters 17
Investigations of, by States 19, 272
Proposed New York Law for regulation of 316
Federal Control of 324

PAGE

Insurance and Insurance Companies—Continued
Use of Standard Appliances by 178
Regulation of Hazards by 205
Resolution of 335

Legislation (see also "Police Power"):
Paper on, by H. L. Ekern 286
Paper on, by Powell Evans 290
Common Law 26, 28
Laws of France 26, 27
Laws of Germany 27
Massachusetts Law as to Explosives 54
Omaha Law as to Stables 279
Pennsylvania Law creating Fire Marshal for Cities 401
Pennsylvania Law creating State Fire Marshal 440
Pennsylvania Law regarding Fire Drills 422
Proposed New York Law for Regulation of Insurance 316
Laws Regarding Steamboats 251
Need of Same by States 288, 291

Legal Decisions:
Negligence defined 26, 29
Damage without injury 28
Liability from Negligence 26
Power of States and Cities 29
Fire Limits (Pennsylvania) 28
Height of Buildings (Massachusetts) 31, 55
Fire Limits (North Carolina) 44
Publicity of Insurance Rates (Pennsylvania) 359
Building Regulations 29
Sprinklers in Factories (New York) 34

Letters from:
The President 10
Underwriters' Laboratories 39
Seattle, Wash. (City Electrician)
Cleveland, O. (City Electrician) 191, 193
Philadelphia, Pa. (City Electrician) 192
Interstate Commerce Commission 233
Pennsylvania R. R. Co. (Mechanical Engineer) 234
U. S. Govt. (Inspector General of Steamboats) 251
League Island Navy Yard (Commandant) 254
William Cramp & Sons Ship & Engine Building Co. 255
Insurance Commissioner of Wisconsin 286
Commission on Uniform State Laws 324

PAGE

Letters from—Continued
Powell Evans to N. F. P. A. 344
N. F. P. A. 348
Opinions on Convention 513-521

Life Hazards (see also "Fire Escapes"):
Paper on, by H. F. J. Porter.. 63
Paper on, by J. P. Jackson 71
Address by L. H. Kunhardt...... 510
Influenced by 65, 69, 70, 72
Should be considered in building design 73
Legal Right to compel safety of. 30
Automatic Sprinkler Value of, in safeguarding 70, 71, 74, 513
Necessity of State Control of.... 74

Lighting Systems (see "Building Construction")

Lighting:
Safeguards for 124

Lumber Yards:
Location of 53, 61

Management and Housekeeping:
Paper by S. G. Walker 264
Paper by W. H. Loller 268
Order and Neatness, need of 264, 269, 280, 281
Laws needed for 293
Placard for "Clean-up Week"... 438
Resolution on 285

Matches:
Dangers of 164

Minimum Requirements:
Discussion of 113, 115

Mines and Mining:
Paper by H. M. Wilson 256
Laws regarding 29
Police Regulation of 225
U. S. Govt. Methods of control.. 257
Mine Fires 258

Moving Pictures (see "Theaters")

National Board of Fire Underwriters:
Description of 468

National Fire Protection Association:
Scope of 18
Description of 472
Methods of developing Standards 175

PAGE

National Fire Protection Association—Continued
Educational work of 303
Committee on Public Information of 336
List of Active Members of...... 347

National Fire Prevention Convention:
Reasons for calling same 15
Letters regarding 348
List of Conferees 523
Cost of Convention and Printing Record of ....2d Cover, 331
Proposal for next meeting of.... 340
Opinions of 332, 511
Reports of Convention by "Fire Protection Magazine" 518
Reports of Convention by "National Fire Protection Quarterly" 521

Occupancy (see also "Management"):
Paper by C. A. Gasser 200
Paper by C. A. Hexamer 203
Paper by Edwin Clark 202
Inspections of 208, 209
License needed for 99, 200, 215, 224
Safety of Life Influenced by 202
Need of Municipal Control for 200, 201, 205, 207
Conflagration Hazard depends on 204
Resolution on 227

Order, Department of Public Safety, Philadelphia 154

Organization:
Address on 465
Need of 338
Discussion of 336

Papers (see "Addresses")

Plumbing (see "Building Construction")

Police Power:
Definition and Scope of 27, 30
As to Building Construction...29, 31, 32
As to Automatic Sprinklers..... 33
As to Segregation of risks....... 29
Discussion of 54

Railroads:
Paper by B. W. Dunn on "Transportation of Explosives"....... 237
Interstate Commerce Commission, letter from 233
Pennsylvania Railroad, letter from 234
Passenger Cars 234
Freight Cars 235
Railroad Inspections, table of.... 240
Railroad Accidents, table of..241, 242

PAGE

Report on Proposed Ohio State Building Code 105

Reports of:
- Fire Waste Committee, Chamber of Commerce of U. S. A......349, 352
- Phila. Fire Marshal (1913)...... 381
- Phila. Fire Prevention Commission (Preliminary) 406
- Phila. Fire Prevention Commission (First Annual).......... 409
- Ohio State Fire Prevention Association 446
- Fire Prevention in Germany..... 449
- Fire Waste 491, 508
- National Fire Prevention Convention
  - From Fire Protection Magazine 518
  - From National Fire Protection Quarterly 521

Resolutions on:
- Fire Waste 9
- "Location"—Topic 1 43
- "Zones of Danger"—Topic 2..... 62
- "Building Construction"—Topic 3 95
- "Building Codes"—Topic 4....... 117
- "Protection (Private)"—Topic 5. 135
- "Protection (Public)"—Topic 6.. 159
- "Equipment"—Topic 7 167
- "Compulsory Standards"—Topic 8 199
- "Occupancy"—Topics 9 and 10. 227
- "Management"—Topic 11 285
- "Legislation"—Topic 12 301
- "Education"—Topic 13 310
- "Insurance"—Topic 14 335
- Chamber of Commerce of the U. S. of A.................. 355

Roofs 269-270

School Buildings:
- Protection for 124
- Fire Alarm for................. 133

Signal Systems:
- Dangers of 163

Sprinklers (see "Automatic Sprinklers"):
- Outside Window Systems.......121, 398

Stables:
- Omaha Law for................ 279

Standards:
- Paper on Compulsory Standards, by Powell Evans.............. 168
- Paper on Compulsory Standards, by H. M. Wilson........... 181
- Paper on Compulsory Standards, by Dr. Rosà 182

PAGE

Standards—Continued
- Should be formulated by U. S. Govt. 179-182, 185, 187, 190-195
- Bureau of Standards, U. S. Govt., description of 183
- Need of High Standards.....188, 194, 195
- Universal Standards (London, 1903) 197
- Of Testing Fireproof floors...... 196
- Proposed for Automatic Sprinkler Systems 176, 177, 487-488
- Appliance, lists of..............169-172
- Method of developing by Insurance Companies 172, 173
- Use of, by insurance companies.. 177
- Resolution on having same formulated by U. S. Govt......... 199

Standpipes and Hose:
- Necessity of 121
- Use of 130, 131, 132

Steamboats:
- U. S. Laws regarding........... 251
- Fire Prevention methods in......254, 255
- Testing of hose on.............. 262
- Use of steam jets on........... 262

Theaters and Moving Picture Shows:
- Fire Escapes for................ 82
- Need of State Regulation for.... 108
- Fire Drills in.................. 127
- Need of Inspection for.......... 153
- Inspections of (Phila.).......... 391
- Inspections Reports of (Phila.).. 417
- Regulations for Theaters (Phila.) 413
- Regulations for Moving Picture Shows (Phila.) 393
- Regulations in Canada........... 449
- Requirement for Sprinklers in... 33
- Form of Public Warning Notice for 416

Underwriters' Laboratories:
- Method of testing and approving devices 172, 174, 175
- Description of 474
- Governing Council of.......... 173

Valves:
- Danger of Closed Valve on Sprinkler Systems 123
- In Public Water Mains......... 137

Ventilation (see "Building Construction")

Water and Water Supplies (see also "High-pressure Systems"):
- Public 136

PAGE

Water and Water Supplies—Continued
Charges for fire service connections 155, 156
Contamination of, by fire service connections 224
For Sprinkler Systems......123, 157, 158
Paper on High Pressure Fire Systems, by Jas. Reed, Jr...... 140
Resolution on 159

PAGE

Watchman's Clocks:
Kinds of 119

Wired Glass:
Opinions of 36, 40, 41, 42
Safeguard to Life............... 70
Size of opening................ 37, 41

Windows (see "Building Construction" and "Wired Glass")

Printed at the Sign of the Ivy Leaf in Sansom Street Philadelphia

Official record of the first Americ
Cabot Science 003862965
3 2044 091 842 450